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"I cannot help plead to my countrymen, at every opportunity, to cherish all that is manly and noble in the military profession, because Peace is enervating and no man is wise enough to foretell when soldiers may be in demand again."—GENERAL SHERMAN.

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CAVALRY OPERATIONS: THE WILDERNESS TO THE JAMES RIVER.

BY MAJOR EDWARD J. McCLERNAND, UNITED STATES CAVALRY.

IN the early days of May, 1864, the Army of the Potomac, under Meade, was encamped on the north side of the Rapidan, with headquarters at Culpeper. It consisted of three infantry, and one cavalry corps. Of the infantry, Hancock commanded the Second, Warren the Fifth, and Sedgwick the Sixth Corps. The Second and Fifth each had four divisions, the Sixth but three. The Cavalry Corps, under Major-General Sheridan, had three divisions, each commanded by a brigadier general. Torbert's division, the First, consisted of three brigades; the 2d and 3d divisions, commanded by D. McM. Gregg and J. H. Wilson, respectively, were composed of two brigades each. Brigadier-General Henry J. Hunt commanded the artillery reserve. Attached to the Cavalry Corps were six batteries of Horse Artillery with thirty-two guns.*

The 9th Corps at Warrenton, under General Burnside, constituted a separate command until May 24th, when it was

*Sheridan's Memoirs says 12 batteries, but see General Hunt's report, volume 36, part 1, page 285 R. R. Later, May 31st, there was an organization into eight batteries, 32 guns; see same report, page 289.

united to the Army of the Potomac, under Meade. Grant, as Lieutenant General, commanded both armies, with headquarters at Culpeper. The aggregate of this force was about 116,000, with 323 guns,* and eight Coehorn mortars. The cavalry had about 12,000 officers and men.†

Confronting this host on the opposite side of the Rapidan was the army of General Robert E. Lee, with headquarters at Orange Court House. It was composed of three infantry and one cavalry corps, the latter under Major-General James E. B. Stuart. The infantry corps, First, Second and Third, were commanded by Longstreet, Ewell, and A. P. Hill, in the order named. In the opening of the campaign the Second and Third Corps had three divisions each, while Longstreet had but two, Pickett being detached. Brigadier-General Pendleton was Chief of Artillery.

Stuart's division commanders, each with the rank of major general, were Wade Hampton, Fitzhugh Lee, and W. H. F. Lee. The Lees had two brigades each. The Rebellion Records assign three to Hampton, but Butler's brigade does not appear in the dispatches until the latter part of May, and apparently did not participate in the part of the campaign we shall discuss. Sheridan places the aggregate of the enemy's cavalry at a little over 8000. There were five batteries of Horse Artillery with twenty guns. Prior to the opening of the campaign this cavalry was guarding the fords of the Rapidan from above Lee's army to Hamilton's crossing,‡ and about this time we find Fitzhugh Lee at, or near, the latter place; Hampton at Milford, and W. H. F. Lee at Orange Court House.

The strength of the Confederate army was about 80,000 men, with 213 guns.

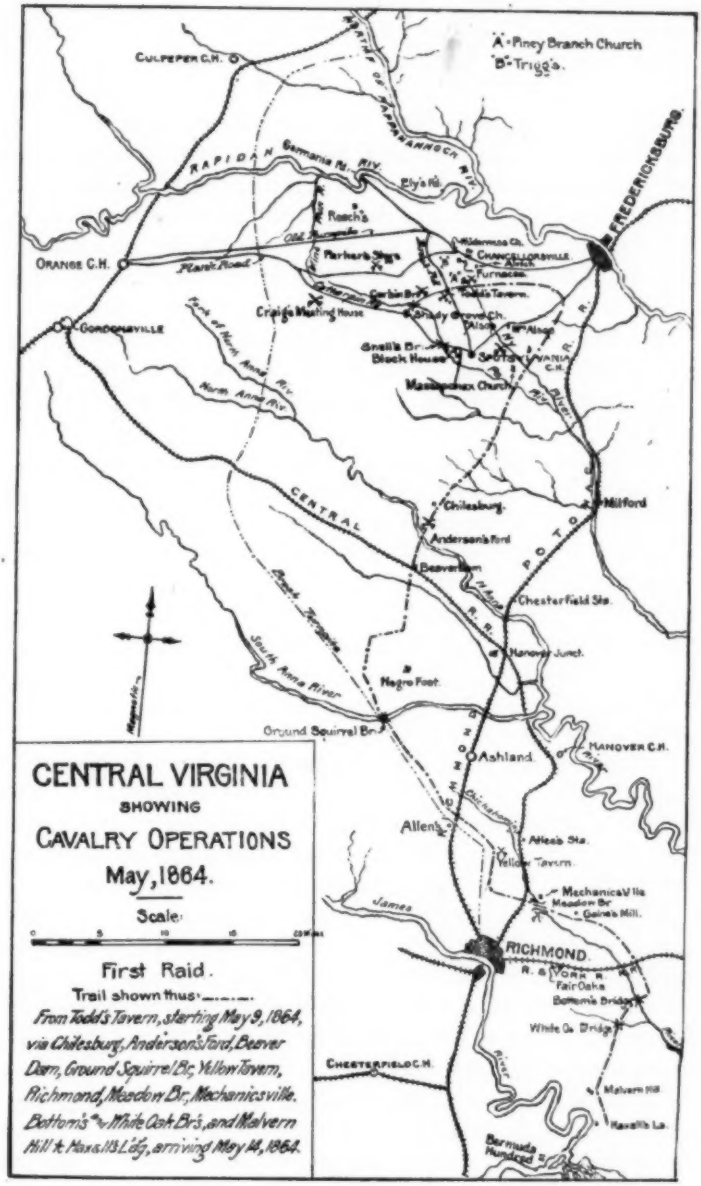
THEATRE OF OPERATIONS.

The country between the Rapidan and the James is admirably adapted to a defensive campaign, being generally heavily wooded and intersected by numerous streams, difficult to cross. In addition to the natural strength of many positions, artificial

* This does not include reserve artillery 9th Corps.

† Sheridan's Memoirs.

‡ Near Fredericksburg.


A-Piney Branch Church
B-Trigg's.
CULPEPER C.H.
FREDERICKSBURG
ORANGE C.H.
GORDONSVILLE
CHANCELLORSVILLE
Rapidan R.
Rapidan R.
Germania R.R.
Plank Road
Orange Plank Road
Parker's Store
Wilderness Ch.
Furnaces
Tabb's Tavern
Corbin's Bridge
Craig's Meeting House
Shady Grove Ch.
Alsop's
Alsop's
Gnall's or Block House
Spotsylvania C.H.
Massaponax Church
Massaponax River
North Anna River
North Anna River
Fork of North Anna R.
CENTRAL
Chilesburg
Anderson's Ford
Beaverdam
Hilford
Chesterfield Sta.
R.R.
Hanover Junct.
Negro Foot
South Anna River
Ground Squirrel Br.
Ashland
HANOVER C.H.
Allen's
Atlee's Sta.
Yellow Tavern
Mechanicsville
Meadow Br.
Gaines's Mill.
James
RICHMOND
R. & York R.
Fair Oaks
Bottom's Br.
White Oak Bridge
CHESTERFIELD C.H.
Malvern Hill
Haxall's La.
Bermuda Hundred
CENTRAL VIRGINIA
SHOWING
CAVALRY OPERATIONS
May, 1864.
Scale:
First Raid.
Trail shown thus
From Todd's Tavern, starting May 9, 1864, via Chilesburg, Anderson's Ford, Beaver Dam, Ground Squirrel Br, Yellow Tavern, Richmond, Meadow Br, Mechanicsville, Bottom's & White Oak Br's, and Malvern Hill to Haxall's Lds, arriving May 14, 1864.

defenses were added at numerous points on the road to Richmond.

COMMENCEMENT OF THE CAMPAIGN.

Soon after midnight, May 3d-4th, the Army of the Potomac moved from its position north of the Rapidan to enter on the ever memorable campaign which terminated at Appomattox Court House on the 9th of April of the following year. After deducting the various detachments ordered for escort and other duty, Sheridan crossed the river with an effective force of about ten thousand troopers.

It is not intended to follow the movements of the infantry farther than is necessary to make the cavalry operations, which in a large measure depended upon or resulted from them, perfectly clear.

Warren's corps, followed by Sedgwick's, and preceded by Wilson's division, crossed at Germania Ford, nine or ten miles below the right of Lee's line. Gregg, in advance of Hancock's corps, and the reserve artillery, crossed at Ely's Ford, six miles below Germania. Torbert's division remained, for the day, north of the river, to guard the fords above Germania, and as a precaution against an attack in the rear. Wilson and Gregg drove off the Confederate pickets, passed the river, and by 6 A. M., the pontoon bridges were ready for the infantry and artillery to cross.

A little after 1 P. M., a message was sent to Burnside to advance.

The country about Old Wilderness Tavern was generally heavily wooded and covered with dense undergrowth, with here and there a small clearing. Most of the roads were narrow and bad. From Germania Ford to Todd's Tavern, we find the Germania, or Brock, road. Intersecting this road were two others, leading to Orange Court House, which were unusually good for this part of Virginia. The northern one was known as the Turnpike, and the other as the Plank Road. By the two latter Lee was enabled to concentrate rapidly to meet Grant.

The crossing of the infantry being assured, Wilson pushed on to Parker's Store, and Gregg to Chancellorsville. Warren took position at the Wilderness Tavern and intrenched, and by

sunset Sedgwick was in position on his right. Hancock encamped six miles east of Warren.

A large force of Confederate cavalry having been reported near Fredericksburg, Sheridan ordered Gregg to bivouac near the 2d Corps. At 7.40 P. M. Wilson reports from Parker's his patrols have been to the Catharpin Road, and also to within a mile of Mine Run, and only met small parties of the enemy.

Lee, however, had learned of Grant's movement, and had started his army to confront him. Hill was to move via the Plank Road, and to be followed by Longstreet, who in the middle of the afternoon was at Gordonsville, more than twenty miles away. Ewell was near by, and halted for the night on the Turnpike, four miles east of Mine Run. Stuart was aware of Wilson's presence at Parker's, and Fitzhugh Lee knew a large cavalry force was near Chancellorsville. We shall find Stuart's cavalry the next day moving towards Corbin's Bridge.

Torbert crossed at Ely's Ford at daylight on the 5th, and moved to Chancellorsville. At 5 A. M., on the same date, Wilson, in compliance with orders from General Meade, which Sheridan says were not communicated to him, left one regiment at Parker's, and with the balance of his division pushed on to Craig's Meeting House, on the Catharpin Road. McIntosh, one of Wilson's brigade commanders, claims the regiment left at Parker's, dismounted and with Spencer carbines, resisted and delayed a large force of the enemy's infantry for three hours. The entire division used in a similar way would probably have caused such delay that Grant would have been able to organize his first line of attack with more method, and with better results. As it was his infantry was thrown into action in great haste, and with much confusion. The regiment referred to being driven back, direct communication with Wilson was lost, and his retreat via Parker's cut off. These facts, however, were not known to him until afternoon. By 8 A. M. Wilson's advance brigade arrived at Craig's, and just beyond encountered Rosser's brigade of Hampton's division. After several handsome charges Rosser was driven back about two miles. At this time the rear brigade was posted at the junction of the Catharpin and Parker roads. Shortly after noon the enemy, being reënforced, assumed the aggressive and drove the Union cavalry back, the

advance brigade being forced back on the rear one, and then both were compelled to retire. Wilson now learned the road to Parker's was held by Confederate infantry, and he decided to retire to Todd's Tavern by a country road, but soon discovered his enemy was pushing in the same direction along the Catharpin Road. With some difficulty he managed to extricate his command, and reached Todd's Tavern, where he was met by Gregg's division, which had been sent to his assistance by Sheridan as soon as that officer had been informed by Meade of the condition of affairs. Gregg attacked the enemy, who was following Wilson, and after a sharp fight drove him beyond Corbin's Bridge. The two divisions encamped so as to cover the roads meeting at Todd's Tavern.

Let us now glance at the infantry struggle during the day. Burnside, who, as stated, was at Warrenton on the 4th, moved promptly when informed the Army of the Potomac was crossing, and although some of his troops had to march forty miles, the head of his column was crossing, at Germania Ford, early on the morning of the 5th. He did not, however, get into action on this date.

Warren was ordered to move early to Parker's Store, but met the enemy *en route*. This fact was reported by Meade to Grant, who at 8.24 A. M., directed "if any opportunity presents itself for pitching into a part of Lee's army, do so without giving time for disposition." * As Meade repeated these directions to Warren, with orders to "attack as soon as you can," it is evident Warren's real fighting did not commence until the morning was well advanced. At 11 A. M., McIntosh, with a regiment of cavalry, reports he has been seriously engaged with the enemy's infantry arriving via Parker's, and says as yet he has received no assistance from Crawford's division, which constituted Warren's advance force on the Parker Road. These statements are important as showing the infantry battle on this part of the field did not commence early in the morning, as might be inferred from at least one leading history of the engagement, as well as to show the part Wilson's Division might have played in front of Hill's corps, had the entire division been entrenched as Parker's.

* Page 403, vol. 36, part 2, R. R.

Infantry continued to arrive, until before night the Army of the Potomac was hotly engaged with Ewell's and Hill's corps. The Union lines extended from near Roach's to the intersection of the Brock and Plank roads. The Confederates, to the west, confronted this position. The next day the Union left rested near Trigg's, and Lee's right was correspondingly extended. On the evening of the 6th Grant's right, under Sedgwick, was forced back to the Germania Road. The battle of the 5th was bloody, without material advantage to either side.

Sheridan's movements were hampered, by having to guard, near Chancellorsville, a train of over 4000 wagons and the artillery reserve. At 11.10 P. M., he writes to Meade, "I cannot do anything with the cavalry, except to act on the defensive, on account of the immense amount of material and trains here. Why cannot infantry be sent to guard the trains, and let me take the offensive?" Certainly more might have been accomplished by the Federal cavalry. With superior forces they should have endeavored to beat Stuart, and to carry confusion to Lee's right and rear. The Confederate cavalry, however, caused General Meade to be anxious as to his left.

May 6th. At 2 A. M. on this date, Custer, with his own and Devin's brigade, advanced from near Chancellorsville to the junction of the Furnace and Brock roads, from where he opened communication with Gregg, at Todd's Tavern. Later, Custer was ordered to advance along the Brock Road, for the purpose of harassing Longstreet's Corps, which was reported as massing on Hancock's left. He met Fitzhugh Lee and a severe engagement occurred, both sides claiming victory. Custer did not harass Longstreet, but he did open communication with Hancock's left. Hancock heard the firing, and believing Longstreet was attempting to turn his left, reënforced it.

At 1 P. M., Meade, because of incorrect information, became alarmed about his left flank, and informed Sheridan that Hancock's left had been turned, and directed him to draw in his cavalry nearer the trains. This was done, Custer retiring about dark. The report proved to be a mistake, and the ground surrendered had to be recovered the next day at the cost of a cavalry battle.

During this day, the 6th, the infantry fighting was sangui-

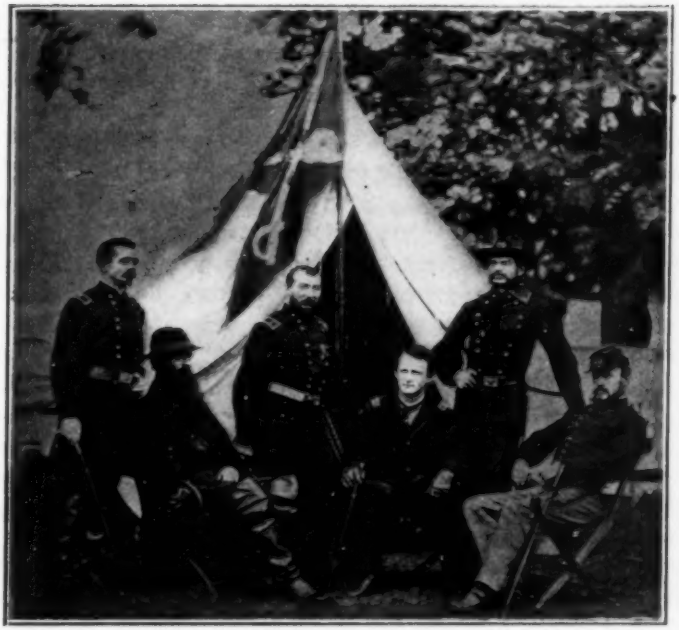
nary in the extreme. Burnside and Longstreet were both up. The latter extended Lee's right, while two divisions of Burnside's corps were placed in the lines of the Army of the Potomac to fill unoccupied intervals; the third division (colored) under Ferrero, was sent to assist in guarding the trains, and Burnside did not see it again until July.

An impartial study of the Rebellion Records will, I think, convince one that the tactical advantage rested with Lee. It will be remembered he forced the Union right back during the evening. Grant, being on his enemy's flank, or at least compelling him to form line of battle parallel to his line of communications (toward Richmond) possessed the strategical advantage.

Referring to the infantry battle of this day, Grant says, "the ground fought over varied in width, but averaged three-quarters of a mile. The killed and many of the severely wounded, of both armies, lay within the belt where it was impossible to reach them. The woods were set on fire by bursting shells, and the conflagration raged." The impression in Lee's army was that Grant was beaten, and would retire. Fitzhugh Lee asked Stuart if, in case the enemy retreated, it would not be well for him (Lee) to cross the Rapidan and get on his flank. They failed to properly judge the metal of their antagonist, who a few days later said, "I shall take no backward step," and who made good his word, though it cost a series of as bloody battles as the world ever saw.

On the 7th it became necessary for the Union cavalry to regain the ground voluntarily given up the day before. "This led to the battle of Todd's Tavern, a spirited fight for the possession of the cross roads at that point, participated in by the enemy's cavalry and Gregg's division, and two brigades of Torbert's division," now commanded by Merritt, Torbert being ill.

Sheridan's orders for this engagement were for Gregg to assail the enemy on the Catharpin Road with one brigade and drive him over Corbin's Bridge, while Merritt attacked him with the Reserve Brigade on the Spotsylvania Road, in conjunction with Davies' brigade of Gregg's division, which was to advance via the Piney Church Road and join Merritt's left.



DAVIES. GREGG. SHERIDAN. MERRITT. TORBERT. WILSON.

After a stubborn resistance Stuart retired towards Corbin's Bridge and Spotsylvania. That evening Sheridan posted Wilson at Alsop's, and withdrew his other divisions to the vicinity of Todd's Tavern. This withdrawal turned out to be unfortunate.

The fighting on this day, the 7th, between the infantry was comparatively little, but Grant had despaired of crushing Lee in the Wilderness, and decided to threaten his communications and line of retreat, by moving to Spotsylvania, and gave orders accordingly to move that night. It was this proposed change that rendered it necessary for Sheridan to regain the Corbin's Bridge and Spotsylvania Roads, and which led to the battle of Todd's Tavern, above described. Lee divined Grant's intentions and ordered Stuart to select routes during the day, leading to Spotsylvania, for the use of the infantry and artillery, and that night started Anderson, who took command of Longstreet's corps after the latter was wounded on the 6th. Grant also com-

menced the movement of his infantry, Warren leading via Todd's Tavern and Alsop's.

Sheridan's combinations for this movement were as follows: As stated, Merritt and Gregg were encamped near Todd's Tavern, and Wilson at Alsop's. The two former were ordered to take position near Snell's Bridge over the Po; Gregg marching via Corbin's Bridge to Shady Grove Church, and Merritt following. At the last named place Merritt was to pass Gregg, and go to the Block House, when Gregg was to retire on the same place.* Wilson was to reach the Block House, by way of Spotslyvania. The evident object of this order was to delay the enemy at the crossing of the Po, should he try to reach Spotsylvania Court House. General Meade, upon his arrival at Todd's Tavern, changed the orders given to Gregg and Merritt, without notifying Sheridan. Gregg was ordered to take position at Corbin's Bridge, and Merritt to move on the Court House, in advance of Warren. In the darkness, on a narrow and poor road, the cavalry and infantry became intermixed, and much delay and confusion resulted. When Sheridan learned of the change, and upon reaching Merritt's column, he found Warren complaining of being delayed by the cavalry, whereupon Sheridan drew Merritt off the road. The latter, however, together with Warren, had a heavy engagement during the morning with Fitzhugh Lee's and Anderson's Corps, in front of the Court House, and both were driven back. Wilson, in pursuance of the original order, moved on the Court House. He met the enemy's pickets at the Ny, drove them back, and beating Wickham's brigade of cavalry took possession of Spotsylvania, where he states he remained at least two hours. He now learned the enemy had crossed the Po, and was engaged with Warren and Merritt, whereupon he fell back and took position near Alsop's. He says he had been informed the 9th Corps (Burnside's) would follow to the Court House, and claims if it had done so "the bloody battles which followed would at least not have been fought at Spotsylvania."

As a result of these misunderstandings a bitter controversy took place during the day between Meade and Sheridan, during which the latter said he could beat Stuart if permitted to go

* Sheridan's Order, 1 A. M., May 8.

and try. Meade repeated the remark to Grant, who replied: "Did he say so? then let him go out and do it." With that end in view the Cavalry Corps was concentrated during the day at Alrich's.

Before dropping the dispute between the two generals, justice to Meade dictates the remark that perhaps the cavalry, instead of being ordered to start for Snell's Bridge at daylight, might have moved at an earlier hour, thus not only leaving the roads free for the infantry, but making more certain the possession of the bridge. The same object might have been gained had Gregg and Merritt bivouaced farther to the front, and not have fallen back to Todd's Tavern after the success of the previous day. It is not certain their position at the Tavern interfered with the passage of the infantry, but it would seem the cavalry should have been well to the front, by the time Warren reached that point. On the other hand, Sheridan may not have been informed of the hour set for the infantry movement. It is clear that at this time General Meade was given, on occasions, to ignoring the cavalry commander. The loss of the Cavalry Corps at the battles of the Wilderness, including May 8, was 710 killed, wounded and missing.

Early on the morning of the 9th, the Cavalry Corps, with three days' rations, and half a day's forage (all there was on hand), commenced its march to gain the rear of Lee's army, and to give battle to his cavalry. The line of March passed through Massaponax Church and Chilesburg to Anderson's Ford, on the North Anna. The column marched on one road and was nearly thirteen miles long, but Sheridan preferred this great length, to the dangers from possible failures, in necessary concentrations, that might result from following different roads.

Stuart learned during the day of the movement, and started in pursuit with his 2d division, and one brigade of the third. Fitzhugh Lee overtook the rear guard of the Union cavalry, under Davies, near Chilesburg, and pushed it vigorously, but through good management on the part of the rear guard commander, the march of the column was not materially interrupted. Sheridan declined battle here, wishing, he says, to first pass the two Annas with the hope of obtaining supplies.

Merritt crossed at Anderson's Ford about dark, and during

the night moved on Beaver Dam station to cut the Virginia Central Railroad. En route a detachment of the enemy was encountered, and about 400 Union prisoners were recaptured who had been taken at the Wilderness. Eight or ten miles of railroad and telegraph line were destroyed, also two locomotives, three trains, ninety wagons, and according to Northrop, the Confederate Commissary General, 504,000 rations of flour, and 915,000 rations of meat. How severely the loss of these supplies was felt is shown by a circular sent out by this Commissary General, on May 10th. In an endorsement to the Confederate Secretary of War, he says "the officers throughout the State have been already urged to collect all the corn, flour and meat possible. The losses at Beaver Dam have caused me to order the following instructions to be sent to all stations at accessible points, viz.: "the interruption of railroad transportation, and the destruction of our subsistence by the enemy, renders it necessary to call upon every person in your district to contribute immediately a portion of their supplies for the use of the army. Impress freely if necessary * * * " "Act with promptness, as the exigency is great."

Some of the supplies destroyed might have been saved for the use of the Union cavalry, for, as Merritt says, "many stores were destroyed which would, as our after experience developed, have been very useful " to our command.

On the morning of the 10th, Stuart, from the north bank of the North Anna, shelled Merritt's camp, and skirmished with Gregg and Wilson, who bivouaced on that side. The march, however, was resumed without difficulty. Early in the morning the 5th U. S. Cavalry, Captain Arnold commanding, was sent to Davenport's Bridge, near Anderson's Ford, as a precaution against attack from that quarter. The regiment was surrounded, but gallantly cut its way out. Gregg and Wilson crossed during the morning. The possession of Beaver Dam was also important in opening a way to Richmond by the Negro Foot Road.

Stuart crossed the North Anna the same morning at the ford and bridge above mentioned, but instead of pursuing the road taken by his enemy he turned off in the direction of Hanover, intending to march rapidly and place his command be-

tween his foe and Richmond. He telegraphed General Bragg, in the city just named, to be prepared in the entrenchments to meet Sheridan, saying, "his force is large and if attack is made it will be principally as dismounted cavalry, which fights better than the enemy's infantry." * * * "Please have this repeated to General Lee."

Sheridan halted on the night of the 10th-11th on the south side of the South Anna, near Ground Squirrel Bridge. At 9 P. M. of this date, Stuart's force, consisting of Wickham's, Gordon's and Lomax's brigades, was at Hanover Junction.

At 2 A. M., on the 11th, Davies' brigade, of Gregg's division, was sent to cut the railroad at Ashland. Davies reached the station in advance of Stuart, and destroyed a locomotive, train of cars, and damaged about six miles of the road. He then rejoined Sheridan at Allen's Station, and the entire command moved on Yellow Tavern, "Merritt in the lead, Wilson following, and Gregg in the rear." Stuart, however, with two brigades, reached the Tavern first, and took position near the forks of the road. From some point south of Hanover he had detached a brigade to again follow Sheridan's rear, and so he now found between himself and this brigade the entire Union cavalry.

As Merritt approached the Brook Turnpike he learned of Stuart's force and position, and at once pushed forward to the attack, and soon getting possession of the turnpike he drove the enemy several hundred yards to the east. Sheridan quickly brought up Wilson and one of Gregg's brigades, and formed his line on the east side of the road. Stuart, with his inferior force, held on manfully, and with a battery that enfiladed the Brook Road "made Yellow Tavern an uncomfortably hot place." Custer, with the 1st Michigan, assisted by a Vermont regiment, charged this battery. At the same time the dismounted troops along the line moved forward. Custer broke the enemy's left, and captured two guns. Gibbs' and Devin's brigades drove his centre and right from the field, while one of Gregg's brigades drove Gordon back, who had followed in rear of the Union column.

This victory gave Sheridan control of the road to Richmond. After Custer's charge the main body of the enemy re-

THE CIVIL WAR IN AMERICA: GENERAL STUART (CONFEDERATE) WITH HIS CAVALRY SCOUTING IN THE NEIGHBOURHOOD OF CULPEPPER COURT-HOUSE.—FROM A SKETCH BY OUR SPECIAL ARTIST.

tired in disorder toward Ashland, while a small party went toward Richmond. The latter rejoined Fitzhugh Lee near Mechanicsville. The casualties on each side were quite severe. The Confederate cause sustained a great loss in the death of that gallant and able cavalryman J. E. B. Stuart, who was mortally wounded in this battle. Sheridan was now near the only remaining railroad by which supplies could be sent from Richmond to Lee at Spotsylvania, and on this day, the 11th, Mr. Seddon, the Confederate Secretary of War, says General Lee is calling on the President for supplies, but because of the result of the battle of Yellow Tavern they cannot be sent to night, and that the Central road has only one engine between Richmond and the break, at Beaver Dam.

How far General Lee was influenced, by uncertain communications, in his later retrograde movement that carried him to the south side of the North Anna, I will let each one of my readers judge for himself.

Sheridan now thought he might pass between the outer and inner lines of fortifications around Richmond, and reach the James River via Fair Oaks, and with this end in view he massed his command on the plateau south of Meadow Bridge about daylight of the 12th. Wilson attempted to pass certain works, but failed, when it became painfully evident a new route must be selected. Custer was accordingly ordered to secure Meadow Bridge, but Fitzhugh Lee, who had assumed command of the Confederate cavalry after Stuart was wounded, had correctly judged the situation, and was now found in position north of the bridge, which was partially destroyed. Merritt was directed to take his entire division and repair the bridge. He was also informed the crossing must be made at all hazards. While the work on the bridge was in progress, Lee opened fire with his artillery and dismounted troopers, and the Confederate infantry came out from their works around Richmond, and attacked Wilson and Gregg. In his despatch of May 14th to Meade, Sheridan estimates the strength of this infantry at two brigades, but later, in his memoirs, he places it at three brigades of veterans, and about five thousand irregular troops. Gordon's brigade of cavalry, which, as stated, was in Sheridan's rear at Yellow Tavern, also attacked Gregg from the Brook Road.

The situation was now critical for the Union cavalry, one from which nothing short of first class generalship could extricate it. Sheridan, who never showed to better advantage than in the crisis of battle, rose to the occasion. Everywhere he met the enemy with a bold front. Wilson was driven back at first in some confusion, but Gregg, in a strong position, brought the enemy to a stand by means of the fire from his repeating (Spencer) carbines, aided by the batteries, and Wilson's men were rallied. Finally the Confederate infantry were driven back, as were the cavalry from the Brook Road, and Merritt forcing the passage of the bridge and driving Lee towards Gaines' Mill, Sheridan remained master of the field. The latter says "I was apparently hemmed in on all sides, but relying on the celerity with which mounted troops could be moved, I felt perfectly confident that the seeming perilous situation could be relieved." He adds "even if it had not been our good fortune to defeat him, we could have crossed the Chickahominy, if necessary, at several points that were discovered by scouting parties." It is perhaps well for the fame of the hero of the ride from Winchester, he was not compelled to attempt such a passage.

The effect of the fire of the repeating carbine is mentioned both by Gregg and Sheridan, and doubtless it largely contributed to the victory. After the battle the Virginia Central Railroad was destroyed for some distance on both sides of the river.

Sheridan now marched leisurely, via Gaines' Mill, to Haxall's Landing on the James, reaching that point on the 14th. Here, he communicated with Butler at Bermuda Hundred, and obtained supplies for 12,000 men, and 14,000 animals. Among the men he, of course, numbered the artillerymen, and doubtless his two hundred and more prisoners, as well as the 400 Union prisoners recaptured at Beaver Dam. The troopers were in high spirits, and according to one of Butler's officers they thought they could go anywhere, and do anything. The horses were jaded; three hundred were turned over as unserviceable, and a number had been shot en route, to prevent their falling into the hands of the enemy. Their weakness was due to lack of forage, as the marches had been short. In fact throughout the raid, which terminated at Chesterfield Station, May 24th,

"the average distance travelled, per day, did not exceed eighteen miles, the longest being thirty."

The loss of the Cavalry Corps, including the artillery, from May 9th, when the raid commenced, to the 24th, was fifty-four killed, 337 wounded, and 224 prisoners—total 625. As there was but little fighting after leaving Haxall's Landing these figures practically answer our present purpose. I have not been able to ascertain the Confederate loss.

While on the James, Sheridan and Butler consulted about the former passing to the south side. In a despatch of the 14th to Meade, Sheridan says, "If I could be permitted to cross the James, and go southward, I could almost ruin the Confederacy." This proposition opens a large and interesting field for discussion, but time will not permit its consideration. On the 15th, Butler actually ordered Sheridan to cross, but no further action was taken.

COMMENTS AND CRITICISMS.

The distribution of the cavalry for the passage of the Rapidan, with a division in advance of the infantry at each crossing, and another guarding the fords above Germania, was judicious, but unfortunately, immediately upon crossing two-thirds of this arm was practically thrown upon the defensive, by being compelled to guard the wagon trains and reserve artillery, a duty that could have been more effectually and economically performed by infantry, especially in the heavily wooded country around Chancellorsville. If it be answered the infantry was needed at the front, it may be remarked that 10,000 aggressive horsemen operating to the front and left front of the army, would have greatly relieved the pressure on the foot troops. Burnside's colored division, which was later sent to the trains, might well have been assigned to this duty from the start. Attention has already been called to what might have been accomplished at Parker's Store, in front of Hill's corps, had Wilson's entire division remained there on the 5th. The reconnaissance to Craig's Meeting House was undoubtedly a wise precaution, but it should have been made by Gregg's division, with Torbert following as far as Corbin's Bridge.

The withdrawal from Todd's Tavern on the afternoon of the 6th was a mistake. If Hancock's left had indeed been turned,

the Union cavalry, instead of retiring toward Chancellorsville, should have fallen upon the flank and rear of the turning force. The unfortunate failure of Sheridan's combinations, because of misunderstandings, to hold the passage of the Po at Snell's Bridge was deplorable, no matter whether this resulted from unnecessary delay in starting the cavalry, or from General Meade's usurpation of the duties of his cavalry commander. Sheridan's orders were wise, and their fulfilment would have given Grant a decided advantage. Both on this occasion, and on the 5th when Wilson was ordered from Parker's without Sheridan being informed, the latter was badly treated, and it is plain there was in Meade's mind no plan for unity of purpose by the Cavalry Corps, and it explains how in previous campaigns its strength had been frittered away.

The control of the Confederate cavalry was far more systematic. Scattered, to perform guard duty and to obtain supplies, before the campaign opened, they were quickly concentrated on the right of their army, and left free to act in their proper sphere. At one stage of the battle of the Wilderness we find them near the Furnaces, that is to the rear of the Union left, alarming the commander of the Army of the Potomac about the safety of his trains, and misleading Hancock by their fire as to the nature of the attack. Fitzhugh Lee's arrival at Spotsylvania, on the 8th, thus securing Snell's Bridge for his army, and preparing the way for Anderson's corps, was timely and of great service to General Lee. On this, as well as on previous occasions, Lee relied greatly upon his cavalry. On the 7th a staff officer of General Lee informs Stuart "he (Lee) relies upon you to keep him accurately informed of the enemy's movements." On the night of the same day Meade changes Sheridan's orders to two-thirds of his corps, and does not even inform the latter of the fact.

The raid on Lee's communications, commenced on the 9th, was fruitful of brilliant results, although perhaps all was not accomplished that might have been. It drew off much of Stuart's force, and simplified the guarding of the trains and reserve artillery. It resulted in disastrous defeats to the enemy's cavalry at Yellow Tavern and Meadow Bridge, and correspondingly increased the confidence and *esprit de corps* of Sheridan's

troopers. It seriously interfered with supplying the Confederate army, and alarmed the Richmond government as to its ability to continue these supplies. It perhaps failed in not damaging the railroads south of the North Anna as fully as might have been done. After the battle of Yellow Tavern, it is believed Sheridan might have devoted his whole energy to the destruction of both railroads towards Hanover Junction, and destroyed them to such an extent that Lee would have at once been forced to retire to the vicinity of Cold Harbor, thus shortening the battles around Spottsylvania, and eliminating those near the North Anna and Totopotomy. Even after Meadow Bridge the same was possible. It is true Sheridan was short of forage, but the results within reach were worthy of great sacrifices. His march to Haxall's Landing was made very leisurely, in fact he "encamped at Walnut Grove from 2 o'clock P. M. of the 12th, until 9 o'clock A. M. of the 13th."

CONCLUSIONS.

This campaign well illustrates the many uses of the dragoon, and goes far to justify Kilpatrick's assertion that cavalry can fight any place, except at sea. To begin, we find the Union cavalry covering the advance, and protecting the flank and rear of the army during the passage of the Rapidan; then well to the front seeking information at Craig's Meeting House, and next, covering the left flank of the infantry in battle at the Wilderness, and in truth Wilson at one time was sent to the right flank, because of alarming, but incorrect, information sent in from that quarter by some new and inexperienced cavalry operating there. Again, we find it under orders to move at early dawn and seize a strategic point (Spotsylvania) to possess which each army was straining every nerve. It is true the latter orders came to naught, but only because of unfortunate delay or uncalled for interference, or both, and not through any weakness of the Northern cavalry.

On the part of the South, up to this stage of the war, we find greater confidence bestowed by the Commanding General of the Army of Northern Virginia upon his Chief of Cavalry, than was correspondingly shown in the Army of the Potomac. In fact, the North entered the great contest handicapped as regards cav-

XUM

alry, by the baleful influence of General Scott, who, misled by what he considered a country entirely unsuited to cavalry operations, early announced but few regiments of that arm would be required, and that artillery would be mainly instrumental in settling the contest. With no intention of disparaging the latter arm, and while recognizing its great importance, attention is invited to the fact that during the bloody campaign to the James, Grant sent back to Washington over one hundred pieces of artillery because they could not be used to advantage, while he repeatedly expressed the need of horses to mount veteran cavalrymen, and his desire that his cavalry return to him from the James as quickly as possible. The old hero of 1812 and the Mexican War sadly misjudged the conditions, and while acting in entire good faith did his country a sorry service; one that greatly reduced the usefulness of the Union cavalry in the early half of the war, and in addition gave a false impression to the people, from which the country yet suffers. The Confederate Government showed a better appreciation of the situation from the first. At an early day that Government organized its mounted force "into compact masses, and plainly made it a favorite." In a telegram of October 25, 1862, President Lincoln says to General McClellan, "Stuart's cavalry outmarched ours, having certainly done more marked service on the Peninsula and everywhere since." McClellan, in his report on the organization of the army, says, because of obstacles he could not overcome, his cavalry in the field was never so large as it should have been. Awakening to the importance of this arm, President Lincoln, on January 7, 1863, asks Halleck, "What think you of forming a reserve cavalry corps of, say, 6000 men for the Army of the Potomac?"

An army should not only be properly supplied with cavalry, but both the officers and men should be thoroughly trained. Men who fight far to the front to obtain information, must be educated in properly digesting and transmitting the intelligence gained, in order that their reports may clearly and faithfully represent the actual conditions to the army commander, whose plans are to be governed thereby. In addition, these men must on many occasions fight as infantry, as well as in the saddle where they act boot to boot in the charge, and in-

dividually in the *mêlée*. All this requires a high degree of training.

May 1st, 1864, Grant asked Burnside if a certain new regiment of cavalry would not be worth more to him on foot than mounted, and adds, "their horses would mount one thousand veteran cavalrymen now with Meade's army, and without horses." Burnside replied he was certain the horses would be of more value to Meade than to himself, but he was afraid he would be short of cavalry. In a communication about this proposed change Grant told Halleck, "a new regiment will be worth something on foot, but less than their forage on horseback." May 2d Meade telegraphed to Augur in Washington, to send by train, if possible, all mounted men, whether fully equipped or not, in the city and belonging to his army. What further evidence of the importance of the arm is necessary then that these experienced generals, on the eve of a great campaign, were leaving no effort untried to provide an adequate, and as far as possible, a trained cavalry force? Halleck, on May 19th, puts himself on record in a telegram to Grant, as follows: "The 21st Pennsylvania Cavalry arrived to-night, fully mounted. Shall I send them forward as cavalry, or arm them as infantry, and give their horses to veterans of the Army of the Potomac? They are new recruits, and of little use as cavalry."

While Grant was willing that Sheridan should cut loose from the infantry on May 9th, to fight Stuart and to cut Lee's communications, by the 17th he again felt the pressing need of having his cavalry with the army, and tells Halleck he wants Sheridan back "as soon as possible." Lee is likewise impressed, and about the same date Fitzhugh Lee says he (Lee) informed him that if any more cavalry be detached from his army it will be impossible to ascertain the enemy's movements.

Later in the campaign, on June 9th, President Davis, recognizing the injury resulting to his cause by the recent defeats of the Confederate cavalry, tells General Lee, "if our cavalry, concentrated, could meet that of the enemy, it would have moral as well as physical effects, which are desirable."

When we remember all this, and further recall that later in the year General Early, commanding the Confederate army in the Shenandoah, reported his mounted infantry having no sa-

XUM

bres, could not meet the enemy's cavalry successfully, and that in the final campaign, terminating at Appomattox, the Cavalry Corps indisputably enacted the leading *rôle*, one can well feel amazed to find persons high in official life suggesting within a year or two before the recent war with Spain the further reduction of our small cavalry force, and saying cavalry can be quickly prepared in the event of war.

As we pass a little further away from the Spanish War and the present insurrection in the Philippines, we may again expect to hear from those who are ever inclined to believe the days of war are over. Others, less extreme, will maintain cavalry can be improvised when war comes. To the latter let us quote the opinions of the great leaders, North and South, mentioned above.

Those of us who are in the cavalry because we love it, who are proud of its traditions, and who aspire to do all in our power to give it a brilliant future, realize its necessities, and the time required and the difficulties to be overcome in moulding a mounted command into efficient shape, but unfortunately it is not so with the country at large. We read too often in the newspapers of the ease with which cavalry can be improvised in the event of war, and this opinion has been too frequently expressed in the halls of Congress. If this error is to be corrected, if the public are to be educated in this vital question, it remains for us to do it. Let us induce our fellow citizens to read aright the lessons of the past, and to study our future needs. Let us make clear to them that if such a man as Grant could advise, when about to join in the death struggle with his adversary, that a new regiment should be dismounted in order to give the horses to dismounted veteran cavalrymen, and that such new men might be of some value on foot, but were not worth their forage on horseback, there must be a great mistake in the current belief that the organization and training of cavalry can safely await the eve of battle.

Recent legislation has added five regiments of cavalry to the regular establishment. They were, and are needed. So far, so good, but they should be kept at the maximum strength. Such a force will be none too large for our needs in the first efforts against any country with which we are likely to be involved in

war in the support of our principles, and commercial interests. There will be enough to do in what follows for a large body of volunteers. It should not be forgotten the recruits added, after the concentration at Chickamauga, to all regular regiments that participated in the campaign against Santiago de Cuba, were an element of weakness—not of strength, and with few exceptions were left in the United States. The lessons of the past, written in letters so large that he who runs may read, point to the necessity for a well organized, instructed and efficient force of cavalry, or more properly speaking, dragoons, ready upon the declaration of war to take to the field and to pass quickly to the front. Let us strive for efficiency at the beginning of a war, at the Bull Run instead of Five Forks—let us in time of peace do with brains and foresight what was pounded into us, at the cost of millions of money and oceans of blood, in four years of war.

ARE DISAPPEARING GUNS ESSENTIAL TO THE EFFICIENT DEFENSE OF OUR SEAPORTS?

III.

By Captain JOHN W. RUCKMAN, Artillery Corps.

AT first thought it may appear a little late to discuss the suitability of disappearing guns for sea-coast defense. The question, as proposed for discussion, implies that a mistake may have been made in the selection of a disappearing carriage for this purpose; at least the question seems to be open to argument and liable to be answered in the negative. Several years ago the project of our coast defense was laid down according to certain lines and the scheme as laid down is now well under way toward completion. The thought, therefore, that comes to one's mind is, what is to be gained now, after so many years of passive acquiescence, by bringing up the subject to unsettle plans completely developed, and more than half executed? This question cannot be answered briefly and as there are many considerations involved, it here becomes necessary to bespeak the reader's patience until all the facts are presented, that he may judge of the propriety of the controversy. When all things are considered, he may see that owing to the peculiar circumstances relative to the construction of our sea-coast defense, this agitation will do no harm no matter what may be the final result.

Owing to our form of government and inherited prejudice against a business-like military organization, military problems are not always solved in the United States by logical and economical methods, and the same influences which, so many times before, have operated to prevent preparation, may have been active in the case now in hand, and have prevented that investigation necessary to a correct solution of the problem. To go a little further it is believed that this suggestion involves a fact no matter what may be the conclusions relative to the suitabil-

ity of the disappearing gun for our coast defense. Our methods of waging war are familiar to all. We always declare war and then prepare for it, generally to the great disadvantage of the object to be attained, and always to the great disadvantage of the United States Treasury. It appears that we have outlined our defensive scheme, constructed our forts, mounted our guns and are now trying to select a carriage for the same. We have here a condition of affairs truly to be regretted. It is an old story, however, to those familiar with the nation's history, in which patriotic citizens have become discouraged and military men, on whom most of the hardships and burdens fall, have all but despaired of improvement.

In writing on the same subject in 1900, the Chief of Engineers expressed himself in a manner which leaves nothing further to be said. * * * "Up to the present time provision has been made for mounting about 60 per cent. of the total projected heavy armament for the sea-coast defense. The annual reports of the Chief of Engineers have yearly laid before the country the progress and condition of our sea-coast defenses. If the present service disappearing carriage should in fact prove unsuited for its purpose, it can only be regarded as most unfortunate that attention has not been called to the matter much sooner. The disappearing principle has so many advantages to commend itself that its relinquishment in favor of some other type of mount could only be regarded as exceedingly regrettable, and such step should not, in my judgment, be entered upon without most careful study." *

From the nature of the subject, where combatant and non-combatant branches are equally concerned in construction and installation of carriages, much difference of opinion must prevail. It is like all questions not susceptible of mathematical demonstration.

The selection of a gun carriage imposes a grave duty and carries with it grave responsibilities. Until 1899 little had been said on the subject of modern gun carriages which were constructed and put in place without protest. In the fall of that year, General Miles, commanding the army, addressed a letter to the Honorable Secretary of War, inviting attention to

* Report of Chief of Ordnance, 1900, p. 317.

the large proportion of guns for coast defense to be mounted on disappearing carriages, including more than half the total number of six-inch rapid-firing guns, to the exclusion of other adopted mounts.* The controversy commenced with this letter, and its agitation in this connection has probably led to more careful study of the subject, at least from a tactical standpoint, than it had received in all the past years.

In this particular case it may be better, even now than never, to discuss the subject and do at this late hour what should have been done in the beginning. In this spirit the following ideas are presented, believing that if correct lines have been followed in the sea-coast defense now is the time to discover it, and that if the contrary be the case, the sooner this unfortunate fact becomes known the better.

Since their introduction into armed conflicts, cannon have been placed behind parapets or other protection, sometimes to the advantage and sometimes to the disadvantage of the defender, but always when he believed that his ends would be furthered thereby. Prominent writers generally agree that protection has its uses in battle when used with discretion, but its use is advocated only when necessary. The idea of protection is therefore more or less relative and considered essential or not according to circumstances, and the question now in issue must be treated along the same lines.

In the defense of harbors, protection has been used to a great extent as exemplified by the thousands of stone walls, parapets, traverses and similar constructions now in existence.

The idea of a cannon that would permit the gun to rise above the parapet, fire its projectile, and then disappear behind cover, is by no means new. A history and description of the numerous designs proposed for this purpose would be out of place here since the writer conceives that the public, particularly the military public, desires more substantial information than history relative to curious but useless designs.

The considerations which led to the introduction and final adoption of the disappearing principle were based entirely upon the additional protection afforded the gun and serving detachment.

* Report of the Chief of Ordnance 1901, pp. 301-2.

In the report of the Chief of Ordnance for 1900 we find the general discussion of the disappearing carriage and a complete history of the subject since it was first agitated in this country.* Quoting from the memorandum accompanying said discussion we present the early views of the Engineer Department touching the disappearing principle applied to sea-coast guns.

* * *

"*Second:* The substitution for the barbette carriage of one which will permit the depression of the gun below the crest of the parapet for loading." †

* * *

"*Second:* To substitute as far as practicable depressing gun carriages for those that expose the armament and cannoneers above the parapet." ‡

* * *

"Relative to the use of sand parapets, * * * It is absolutely essential, however, that a carriage that shall lower the gun below the parapet shall be provided in order to secure these benefits, and accordingly the use of such carriage was approved as among the principles or rules to govern the construction of our works of defense. Efforts to secure such a carriage have therefore been continued."§

* * *

These earthen barbette batteries, with massive parapets, traverses on either side of the gun, and strong parados where needed, will furnish (with a depression carriage) the greatest protection for armament or cannoneers that can be obtained outside of iron casemate construction.‖

* * *

"That our guns should be efficient we must have guns of power not inferior to those that will be brought to contend with them. These guns must have protection, whether by earthen parapet and depressing carriage or by iron armor, no less efficient than that which protects the hostile gun."¶

* Senate Document No. 322, Fifty-sixth Congress, first session.

† Report of Chief of Engineers, 1870. p 5.

‡ Report of Chief of Engineers, 1871, 4-5.

§ Report of Chief of Engineers, 1872, pp. 2-3.

‖ Report of Chief of Engineers, 1875, p. 4.

¶ Report of Chief of Engineers, 1878, pp. 4-5.

XUM

* * *

"What is imperatively demanded besides large guns to render these barbette batteries effective against a modern fleet is additional protection to guns and gunners; such protection, at least, as would be afforded by a depressing or counterpoise carriage automatically arranged to drop the gun behind the parapet at the moment of each discharge and carry it up again into battery when loaded and ready for firing. It should, if practicable, do even more than this. We need the best depressing system that can be devised, and with the best our barbette batteries will still be vastly inferior to casemated works in security to guns and gunners, and in the defensive power which that security necessarily confers. With a suitable gun and a depressing carriage provided with a grape and canister proof shield, or some equivalent device to protect the gunner just before firing, all of our open batteries would be rendered reasonably efficient.*

"We have no carriages for barbette guns of large size except those which require the cannoneers to mount the parapet to load, thus exposing them to be picked off in detail by an enemy's sharpshooters." †

* * *

"The guns and carriages of a barbette battery are exposed to damage and destruction from the distant fire of ships of war lying beyond the armor-piercing range of our forts, and at closer distance the fire of shell, shrapnel, etc., may be effective in driving away the gunners and silencing the battery." ‡

* * *

"These considerations, looking also to the fact that many barbette batteries, from the nature of the site, have but small elevation above the water level, point to the necessity of some arrangement by which the guns may be loaded under the shelter of the parapet, so that the men and gun may not be seen during the act of pointing and firing." §

* * *

"The method of mounting guns of inferior calibre will de-

* Report of Chief of Engineers, 1881, pp. 56 and 407.
† Report of Chief of Engineers, 1882, p. 7.
‡ Report of Chief of Engineers, 1883, p. 52.
§ Report of Chief of Engineers, 1883, p. 52.

pend upon circumstances. The modern naval vessel, in addition to its heavy batteries, is liberally supplied with small rifled guns, howitzers, and Hotchkiss or other machine guns. If the defensive battery is so located as to be exposed to a concentrated fire of this description, the guns must either be mounted on disappearing carriage or be protected by iron armor." *

* * *

"(1) Armaments of the heaviest rifled guns mounted on disappearing carriages, which while widely dispersed, can concentrate their fire on the enemy's vessels." †

* * *

"No works which contemplate the use of iron are now being built, but concrete covered with sand is being used to shield the armament and gunners, and the disappearing principle of mounting guns has generally been had in view in designing batteries.‡

These selections, covering a period of twenty years in the early development of our defensive system, leave no doubt as to the reasons for adopting the disappearing carriage. From them it appears that the fundamental idea embraced is the additional protection provided by the disappearing principle. This is the reason for its being. In writing on the question in 1900, General John M. Wilson, Chief of Engineers, says: "The objects to be sought in mounting heavy sea-coast guns are to secure the greatest offensive efficiency for the guns, the greatest possible material protection for the guns, mounts and detachments, and the greatest possible economy. These conditions are mutually incompatible, but are more nearly realized in the disappearing principle than in any other form of sea-coast mounting, existing or proposed." §

The disappearing carriage is beyond question more complicated, more costly, and slower in its operation, than non-disappearing types, in addition to other disadvantages. These tend to neutralize the advantage in protection secured and the controversy reduces to the question of whether the protective ad-

* Report of Chief of Engineers, 1884, pp. 7 and 56.
† Report of Chief of Engineers, 1889, p. 5.
‡ Report of Chief of Engineers, 1891, p. 5.
§ Report of the Chief of Ordnance, 1900, p. 316.

vantages exceed the disadvantages inherent in the more complicated, slower and more expensive disappearing system. In other words, the complete presentation of the subject must be similar to the page of a ledger, on one side of which appears the positive and on the other the negative entries, on the one side the credits and on the other the debits, both of which must be summed up at the bottom in orderto determine the amount and character of the balance at the end.

In this as in other matters it is a question of profit and loss to be determined by the relative values or weights of protection on the one hand and cost, tactical and ballistic efficiency, personal, moral and national characteristics, discipline and safety on the other. The value of these factors vary so much with different minds that the difficulty of securing a fair trial by an impartial jury is apparent.

Literature on this subject consists largely of opinions without any particular relation to historical facts, which should have great weight in the discussion, and it is here the intention to adhere to them as closely as possible, and lay them before the reader without introducing opinions except when necessary to clearness and accuracy.

All things considered, is the disappearing carriage better suited to our coast defense than any other carriage, and will it give us greater security against attack and danger from other nations? In the final arbitrament of the question there is a vast field for difference of opinion and speculation.

I. COST.

Cost is an important item in any enterprise. It is particularly important in the defense of a nation. It is generally the first thing thought of and the last thing remembered in great undertakings. Armaments and armies are to nations what insurance is to individuals, intended in both cases to protect against unforeseen but possible disasters. If the protection cost too much it is not maintained, if little, both prefer the outlay to the risk of reverse or the fortunes of war. The welfare and even the existence of a nation depend upon this insurance, the support of which, in this era, must be expensive. Coast defense systems are therefore subject to a constant struggle between

economy on the one side and efficiency on the other. To use the words of the Chief of Engineers, these two elements are "mutually incompatible."

With regard to sea-coast carriages, it does not follow that the most expensive one is best for the purpose, or that the cheapest is the most suitable. Modern ordnance and fortifications, whatever their character, are costly, and it often happens that certain requirements must be fulfilled regardless of cost. As suggested by the Chief of Engineers, in developing defensive projects it always becomes necessary to trim, adjust and evaluate, in order to determine which class of machine, all things considered, best serves the welfare of the country and the interests of the *national treasury*. These remarks apply with special force to the gun-carriage question. The gun is constructed to throw the heaviest practicable projectile with highest possible velocity. There is no diversity of opinion on this point. Having obtained an expensive gun that gives satisfactory results, there may and frequently does exist a strong temptation to economize by mounting it upon a poorly constructed or designed carriage.

Construction and transportation cost money, the preparation of the site costs also, and keeping them in a state of preservation and repair still more. All these sources of outlay must be ascertained in reckoning the total or ultimate expenditure.

1. *Mechanical Construction.*—It is generally conceded that, for a given gun, a disappearing will cost more than a non-disappearing carriage. This applies to all classes of disappearing carriages. In the recent controversy this assumption has not been denied and all authorities within the knowledge of the writer accept it as a fact.

The Buffington-Crozier carriage is typical of its kind, has, we believe, been more thoroughly tested than any other design, is equal to or superior to any other yet constructed, and having been adopted by the United States, the following remarks, will, as a rule, be devoted to it in comparison with simple barbette and pedestal mounts such as are now generally used in the United States and Europe.

The Buffington-Crozier carriage undoubtedly costs more than the simple barbette mounts for same calibre now used in

this country, but the difference in cost is not so great as would at first appear. The price of these carriages has varied from time to time and in different places. What is desired here is not so much the actual as the relative cost, since in the comparison it will be to the relative value that all results must finally reduce. With this object in mind the following data have been collected and arranged in tabular form to facilitate comparison.

COST OF BUFFINGTON-CROZIER AND BARBETTE CARRIAGES FOR SIX, EIGHT, TEN AND TWELVE-INCH GUNS.

	6″		8″		10″		12″	
	Disappearing	Barbette	Disappearing	Barbette	Disappearing	Barbette	Disappearing	Barbette
Maximum	7,400	6,800	12,820	10,900	19,000	11,000	42,000	19,000
Minimum	6,450	6,800	9,500	7,500	15,500	11,000	32,000	14,220
Mean	6,875	6,800	11,160	9,200	17,650	11,000	37,000	16,610
Mean from all sources	7,000	6,800	11,000	8,700	18,000	11,000	36,000	17,000
Balance in favor of Barbette Mount		200		2,300		7,000		19,000

The fourth line of figures in the table are obtained from taking a mean of all values available, and represent the fairest average and are used in the following deductions. The cost of both carriages is almost the same for the small calibres and the difference increases from two hundred dollars for the six-inch to nineteen thousand for the twelve-inch.

Transportation, though less important than original cost, must be counted; it will vary directly with the weight, which is much greater for the disappearing carriage.

2. *Preparation of the Emplacement.*—The greater cost due to the disappearing system is not limited to that of the carriage alone. The emplacements cost more than for the simple barbette gun and this fact is frequently omitted in comparing the relative cost of the two systems. The Lieutenant General Commanding the Army, in his letter to the Honorable the Secretary of War, dated October 14, 1899, says, "* * * It is costly to install and maintain, and at least 25 per cent. more costly in the

engineering work of emplacement and magazines than the protected barbette mount. *

The Chief of Engineers, by endorsement on letter just mentioned, refers to the cost of emplacements as follows:

"Reference to the comparative cost of engineering work on emplacements for 12″ guns on disappearing carriages and for 12″ guns on non-disappearing carriages the records of this office give an average cost per emplacement for the disappearing carriage of $54,260 and for the non-disappearing carriage of $50,270, a difference of 8 per cent. in favor of the emplacement for the non-disappearing carriage. These averages were derived from the actual allotments for thirty-four emplacements for the disappearing carriage and for nineteen emplacements for non-disappearing carriages constructed during the years of 1898 and 1899." †

This small difference would seem impossible unless the parapets be made the same height in both cases, which is stated to be the fact by the Chief of Ordnance in considering the cost of engineering features for the site of the disappearing carriage.

"The cost of emplacements for the barbette and disappearing carriages should not differ greatly. In both cases the same height and thickness of parapet have to be provided. It is believed that the difference for the work, instead of being 25 per cent. of the cost will be less than 10 per cent. thereof. Upon this point, however, precise information can be obtained from the Chief of Engineers." ‡

The following data are derived from the drawings published by the Ordnance Department:

Kind of carriage.	Difference in reference between Trunnions and lowest point in carriage. Gun in Battery.			
	6″	8″	10″	12″
Buffington-Crozier	14′–.54″	15′–2″.64.	20′	24′–6″
Armstrong (Pedestal)	4′–1.50			
Barbette (simple)		7′–10	9′	9′–6″
Difference in reference between disappearing and other gun on same site	10′–.04″	7′–.64″	11′	15′

* Report of the Chief of Ordnance, 1900, p. 302.

† Report of the Chief of Ordnance, 1900, p. 317.

‡ Report of Chief of Ordnance, 1900, p. 304.

The difference shown in the lowest line of the table is the excess of height of the disappearing over the barbette gun mounted on the same site. If the parapets be made the same height for each carriage, it would appear that those for the barbette carriages are being built approximately ten, eight, eleven and fifteen feet respectively, higher than necessary, without apparent object or compensating advantage. These additional heights are clearly superfluous for the barbette guns and introduce serious objections in the way of loss of danger space, as will be shown later.

Further inquiry into this subject shows that the small difference in cost of emplacement for the twelve-inch gun, for the two classes of carriage mentioned by the Chief of Engineers, does not obtain for the smaller calibres, and that the relative cost varies from nearly equality for this gun to nearly three times as much for the six-inch disappearing carriage, as for the simple barbette mount.

Cost of emplacement has varied considerably with the locality, sometimes from forty to forty-five per cent.

The policy of building the parapets for both classes of carriage the same height is not easily understood in view of the great difference in necessary height of gun in the two systems. In the case of the 12″ gun fifteen feet of unnecessary height is added to the parapet for the barbette mount and the additional cost of the same caused thereby, is clearly brought to light by the following comparative statement of cost of emplacements for four calibres:

APPROXIMATE COST OF, AS CONSTRUCTED.

CALIBRE.	6″	8″	10″	12″
Disappearing Carriage.	$27,000	$45,000	$47,000	$54,000
Barbette (simple).....	10,000	27,500	31,000	50,000
Balance in favor of the Barbette Mount.....	$17,000	$17,500	$16,000	$4,000

The difference in reference of gun in firing position for the first three calibres is nearly the same and the difference in cost of the two emplacements is practically constant, while for the twelve-inch gun where the difference is fifteen feet, the two

classes of emplacement cost nearly the same. For the proposed 16″ gun on disappearing carriage, the difference of reference would probably rise to 20′, and the cost of the parapet and emplacement would be great, but according to the plan followed for the barbette carriages the cost of emplacement for the latter carriage would be the same as for the former.

Taking cost of carriage, emplacement and gun, calibre for calibre, we have the following aggregates per gun in position, for the two classes of carriage:

DISAPPEARING GUNS.

	6″	8″	10″	12″
Disappearing Carriage	$ 7,000	$11,000	$18,000	$36,000
Emplacement	27,000	45,000	47,000	54,000
Gun	6,000	12,000	25,000	41,000
Total per Gun	$40,000	$68,000	$90,000	$131,000

BARBETTE GUNS.

Calibre of Gun.	6″	8″	10″	12″
Barbette Carriage	$ 6,800	$ 8,700	$11,000	$17,000
Emplacement for same	10,000	27,500	31,000	50,000
Gun	6,000	12,000	25,000	41,000
Total	$22,800	$48,200	$67,000	$108,000
Total for gun on Disappearing Mount	$40,000	$68,000	$90,000	$131,000
Balance in favor of Barbette Mount	$17,200	$19,200	$23,000	$23,000

The above figures show that for every 100 guns of each calibre mounted on disappearing carriages, 171 of the six-inch, 142 of the eight-inch, 134 of the ten-inch, and 121 of the twelve-inch could be mounted on simple barbette carriages. The average balance in favor of the barbette mount is about $20,600, which would probably install a rapid-firing six-inch gun with shield on pedestal mount, giving a muzzle velocity of 3000 feet and capable of being fired eight times per minute. Therefore by mounting the heavier guns on the simple barbette mount, for each one so mounted another of the kind just described could be mounted for the additional money now being expended on disappeariug mounts. This would provide the defense with

XUM

the same number of guns and give it in addition an equal number of the six-inch rapid-firing guns, whose presence in future defense of harbors will be essential to success. This phase of the problem demands reflection.

3. *Preservation and Repair.*—Cost of preservation and repair, unlike the original cost of construction and installation, continues from year to year and goes on forever. This source of expense is an unknown quantity, but owing to the greater size, complication and number of parts, the disappearing carriage requires more labor and materials for its protection. The cost of repairs will in the long run be in direct proportion to the number of parts concerned, provided these parts are all of the same or similar character, but for the disappearing carriage a higher ratio might be assumed in comparison with the barbette carriage, since the additional parts of the former consist more generally of the delicate kind and more subject to disorders. These statements are but plain propositions in probabilities.

Mounting the gun on the disappearing carriage is much more tedious, destructive of material, and dangerous to the gun and carriage than on the simple barbette carriage. This is particularly so when the labor of mounting is done by contract, or labor hired by the Engineer Department, as has frequently been the case.

4. *Complication of Mechanism.*—The disappearing carriage has complexities of mechanism not embodied in the other mount. This element introduces difficulties of service not found in the other system, but this is a part of the price that must be paid for the greater protection afforded. The Chief of Ordnance discussing the merits of the system in this respect, says * * * "The mechanism of the service disappearing carriage, although there is somewhat more of it than in the barbette carriage, is no more complex than the latter. * * * It will be seen (from the blue prints) that both types have approximately the same elements. The vertical slides which form the cross-head guides for the disappearing carriage, two of the axles of the gun levers, and two of the smaller axles of the elevating arm are not found on the barbette carriage, but these are very simple mechanical parts. Both types have the same

style of turn table for horizontal motion, the same class of hydraulic recoil cylinders, the same species of traversing and elevating gear. It may be added that the liquid pressure in the hydraulic cylinders upon recoil is very much greater in the barbette carriage. Both types require constant daily care to keep them in working order, being in that respect like other machines." *

It scarcely seems credible that he could have been familiar with both carriages when he wrote the above remark pertaining to the comparative complexity of the two carriages. The necessity for simplicity in a gun carriage cannot be better stated than in his own words, delivered in April, 1900, when before the Senate Committee, which at that time was considering the advisability of further appropriations for the Emery disappearing carriage. * * * "Any one can make a complicated mechanism, but it takes a man of ability to make a simple one that will do the work. That is what we aim at in inventions for the military service. The simpler they are the better they always are. We try to avoid complications in every way. That is the basis, you might say, of some of the objections I have to this (Emery) carriage. It is on account of the many parts and complications, the springs and hydraulic cylinders and valves, and all that sort of thing, which are so apt to get out of order. If experience is worth a cent, they will get out of order, and that is the reason why I am so positive in my opinion about that carriage." † These remarks are positive. As he says, "If experience is worth a cent," complicated machines will get out of order, and experience has demonstrated this truth too many times to admit of doubt on this point.

The remarks of General Miles on this question are strictly to the point. In the letter previously mentioned he writes, * * * "The mechanism of these disappearing carriages is complex in the extreme, consisting of a great number of parts, and requiring constant daily care on the part of the artillery troops to keep it in proper working order, even under the conditions of peace practice. During the past year accidents which have temporarily disabled the guns have been of frequent occur-

* Report of the Chief of Ordnance, 1900, p. 303.

† Report of Chief of Ordnance, 1900, p. 358.

rence at the different artillery posts, due in some cases to defective material, in others and more rarely, to lack of proper care, but primarily due in most if not all cases to defects inherent in the disappearing system."*

A better confirmation of his words of condemnation of complicated machines for the military service could not be desired.

In the Instructions for Mounting, Using and Caring for the disappearing carriage, L. F. Model 1896 for 8" Rifle (published by the Ordnance Department) are found the names of the different parts of the carriage and the details of its construction. In similar publications for the simple barbette carriage we find similar details and a comparison of the data there given will enable the reader to form a fair idea of the relative complexity of the two carriages. The number of large parts making up the disappearing carriage is approximately three hundred and forty and the small pieces including bolts about fourteen hundred, while for the other carriage these numbers are about one hundred and thirty, and six hundred and sixty respectively. The weight of the disappearing carriage is about ninety-three thousand pounds and for the barbette carriage about fifty-five thousand pounds.

Experience shows that the parts that give most difficulty at drill and practice are the counter-weights, cross-head guides, guide clips, tripping, elevating and retraction mechanism, and sighting and loading devices. Some of these could be corrected and others are so defective as to necessitate change of design. These, generally speaking, are not found on the barbette carriage.

The cross-head guides and clips are a constant source of trouble.

The cross-head moves along the guides with a sliding motion, under constraint of the highest order. Satisfactory action of the carriage depends upon uniform friction between the sliding parts which, as a rule, is practically impossible. Friction varies from hour to hour, with the amount of lubrication, dust and sand blowing about, and frequently a carriage left in working order at night will not go into battery in the morning, without a re-adjustment of the counter-weight. The Board of Ord-

* Report of Chief of Ordnance, 1900, p. 302.

nance in reporting on the Howell disappearing carriage say "The great merit of the carriage when considered for the service is the absence of sliding parts."* This is a silent admission that the sliding parts in the present service disappearing carriage are, to a certain extent at least, unsatisfactory.

In the older models the tripping devices were defective. To trip required that the cannoneers should hold the dogs clear of the ratchet during the descent of the counter-weight and cross-head. With this arrangement the carriage was constantly in danger of being smashed, in case a cannoneer should slip, or be wounded or killed in battle.

The Ordnance Department declined to alter the mechanism until it should be proved that it was impracticable for the artillery officer to watch the cannoneers during the tripping movement during drill and action.

Within a year from this date the country was engaged in war, and the guns in issue in the above controversy were manned by a battery which, part of the time had an officer just appointed from civil life, and the rest of the time no officer at all; most of the cannoneers were recruits and the non-commissioned officers were new and without experience. Such conditions will recur in war, and only such gun carriages will survive the war as possess an inherent safety and cannot be rendered unserviceable by the slightest accident. Officers, if they happen to be present, have more important duties prescribed for them than to stand during action watching green recruits to keep them from smashing delicate parts of a complex carriage, which, from an artilleryman's standpoint, should be above such dangers. A recent appointment from civil life in command of a hundred recruits, or volunteers, will have no time to devote to such duties. In some of the more recent models, at least, this particular defect would appear to have been removed, but others remain of similar character, and the principle remains the same. A carriage which exacts such duties of the officer is not fit for the sea-coast service.

The service disappearing carriage is particularly affected by the sand blast existing along the coast. The sliding parts become clogged, and, owing to the difficulty of getting at the

*Report of Chief of Ordnance, 1899, p. 411.

XUM

surfaces, the sand can be removed only with great labor, perhaps to be blown in again the same day. A readjustment of the counter-weight becomes necessary, or a change in the oil in the cylinders. Both of these operations are tentative and differ for drill and practice, and for full and reduced charges. In short, with every new set of conditions, a new and original problem arises for solution, and one feels compelled to stop and consider what would be the result of being compelled during battle to adjust counter-weights, rig retraction gears, or change the amount of oil in the cylinders, necessitated perhaps by a change of ammunition.

In an endorsement on the letter of General Miles, above referred to, General John M. Wilson, Chief of Engineers, closes his remarks in the following words: "Granting for the sake of argument, that the disappearing principle is somewhat more complex than the non-disappearing carriage, these are but the natural results of progress in the art of war, which has reached such a stage that the coast artillery are to-day calling for complete electric light and power plants with numerous accessory electrical appliances for transmitting communications, meteorological instruments, etc., as adjuncts of sea-coast batteries.

"A somewhat more complex system of gun-mounting is surely not out of place in a system otherwise involved in complexities of the gravest character."*

The point here made would seem to be well taken, and the complexities in apparatus for artillery work have by many been questioned as of doubtful utility. It will be borne in mind that no one advocates the introduction of complex appliances except when necessary. They are called for and introduced, not because they are complex, but because their usefulness will exceed the drawbacks that will accompany them. This condition must be fulfilled by the sea-coast carriage, as well as by all other classes of machinery for military purposes.

Touching the subject of care of the carriage, the amount required for the disappearing carriage may be taken at not less than ten times that for other carriages, and the writer is not aware of any barbette carriage that ever failed to run "in battery" although neglected for months at a time. The question

*Report of Chief of Ordnance, 1900, pp. 317-313.

of care, however, is one of small moment in this discussion, since if the conditions of the sea-coast demand the disappearing type for efficient defense, they also make proper care of the same imperative on the part of the artillery soldier.

II.—BALLISTIC REQUIREMENTS.

The ballistic requirements of modern artillery and the height of gun above the level of the sea are closely related to each other. In former times the great height of a gun was held to be an advantage, or at least not a condition to diminish the efficacy of fire. With the continual flattening of trajectories in recent years it has become a question of vital importance.

In order to illustrate the subject the accompanying numerical results have been computed, arranged and tabulated so as to speak for themselves. They are arranged progressively in order to show the increasing effect of height of gun, with increase of weight and velocity of projectile.

(1) The first one considered is a 12 cm. R. F. gun using a projectile weighing forty-five pounds fired with a muzzle velocity of 2000 feet. Although this velocity is decidedly low and, for this calibre, has been obsolete for years, a study of the table reveals facts not generally appreciated. It is recommended to the reader for study and reflection. The gun itself being no longer classed with modern artillery, to discuss it would be to waste time without result and it is well to pass to the next without delay.

(2) The second one taken up is the 12 cm. Armstrong R. F. gun whose projectile weighs forty-five pounds, and muzzle velocity 2600 feet. This velocity is comparatively low for rapid-firing guns of this calibre and the gun has already fallen back to the end of the procession which moves steadily forward without slackening its pace. The great loss of danger space due to height of gun above sea level is clearly demonstrated by the table.

(3) The third case is the five-inch rapid-firing gun with projectile weighing fifty-five pounds, and muzzle velocities of 2700 and 3000 feet. In case of the 2700 feet velocity, observe the danger spaces for the heights of target given and the ranges of 2063 and 3181 yards, and zero height of gun, and compare them with the corresponding danger spaces determined when the gun is ten and twenty feet higher.

XUM

A.—12 c. m. R. F. Gun.

Weight of projectile..... 45 lbs.

RANGE.	MUZZLE VELOCITY.	ALTITUDE OF GUN.	Danger Space of Trajectory in Yards for Following Heights of Target.									
			5 ft.	10 ft.			20 ft.			30 ft.		
				Trajectory.			Trajectory.			Trajectory.		
			End of Trajectory.	Beginning.	End.	Total.	Beginning.	End.	Total	Beginning.	End.	otal.
2000	2000	0	53	125	105	230	255	215	470	405	340	745
		10	45	...	94	94	140	194	334	290	305	595
		20	37	....	82	82	...	174	174	155	275	430
		30	33	....	70	70	....	152	152	....	245	245
		36	31	....	67	67	....	144	144	...	227	227
		40	30	....	65	65	....	138	138	....	215	215
		50	28	....	60	60	....	125	125	....	194	194
		60	25	....	53	53	....	112	112	....	173	173
1500	2000	0	30	170	165	335	220	385	605	....	....	1500
		10	70	....	140	140	210	322	532	600	650	1250
		20	60	....	115	115	....	265	265	290	470	760
		30	50	....	105	105	....	230	230	....	385	385
		36	47	....	96	96	....	209	209	....	346	346
		40	45	....	90	90	....	190	195	....	320	320
		50	40	....	85	85	...	173	173	....	280	280
		60	34	....	75	75	....	155	155	....	245	245
1000	2000	0	135	400	380	780	....	....	1000	....	....	1000
		10	100	....	220	220	....	....	1000	....	....	1000
		20	80	....	175	175	....	455	455	....	....	1000
		30	65	....	135	135	....	310	310	....	710	710
		36	58	....	120	120	....	268	268	....	543	543
		40	54	....	110	110	....	240	240	...	427	427
		50	42	....	86	86	....	190	190	...	325	325
		60	33	....	70	70	....	155	155	...	255	255
500	2000	0	500	....	...	500	....	....	500	....	....	500
		10	125	....	....	500	....	....	500	..	....	500
		20	80	....	250	250	....	....	500	....	....	500
		30	56	....	124	124	....	275	275	....	....	500

Also compare each of these series of numbers with the corresponding ones for the same gun and muzzle velocity of 3000. It will be seen that the danger space increases with the muzzle velocity and the flattening of trajectory resulting therefrom,

B.—12 c. m. R. F. Gun (Armstrong).

Weight of projectile..... 45 lbs.

RANGE.	MUZZLE VELOCITY.	MAXIMUM ORDINATE.	ALTITUDE OF GUN.	Danger Space for Heights of Target Given Below.											
				5 ft.			10 ft.			20 ft.			30 ft.		
				Trajectory.			Trajectory.			Trajectory.			Trajectory.		
				Beginning.	End.	Total.	Beginning.	End.	Total.	Beginning.	End.	Total.	Beginning.	End.	Total.
1000	2600	6.54 ft.	0	260	260	520	All	All	All	All	All	1000	All	All	1000
			10	....	155	155	....	370	370	All	All	1000	All	All	1000
			20	....	113	113	....	250	250	....	800	800	All	All	1000
			30	....	70	70	....	195	195	....	459	450	All	All	1000
2000	2600	31.53 ft.	0	94	80	174	195	160	355	436	362	798	850	750	1600
			10	....	75	75	....	150	150	220	323	543	487	547	1034
			20	....	70	70	....	140	140	....	300	300	233	485	718
			30	....	65	65	....	130	130	....	274	274	....	432	432
3000	2600	87.46 ft.	0	54	34	88	109	70	179	220	145	365	338	230	568
			10	....	33	33	....	68	68	110	141	251	225	220	443
			20	....	32	32	....	66	66	....	137	137	108	210	318
			30	...	31	31	....	64	64	....	133	133	..	200	200

C.—5-inch R. F. Gun.

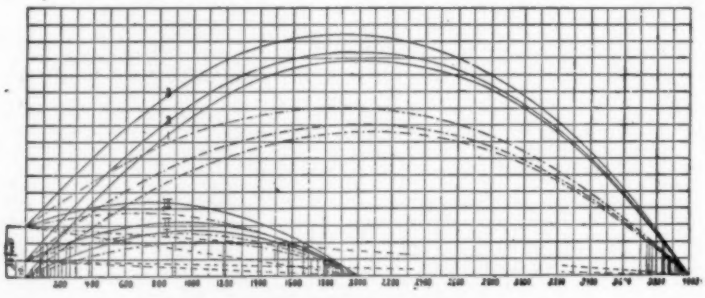
Weight of projectile..... 55 lbs.

RANGE.	MUZZLE VELOCITY.	MAXIMUM ORDINATE.	ALTITUDE OF GUN.	Danger Space in Yards for Heights of Target Given Below.											
				5 ft.			10 ft.			20 ft.			30 ft.		
				Trajectory.			Trajectory.			Trajectory.			Trajectory.		
				Beginning.	End.	Total.	Beginning.	End.	Total	Beginning.	End.	Total.	Beginning.	End.	Total.
2063	2700	30	0	100	80	180	208	173	381	475	405	880	All	All	2063
			10	....	72	72	...	155	155	240	350	390	570	660	1230
			20	....	65	65	....	137	137	....	310	310	582	540	822
3181	2700	88.25	0	56	42	98	113	76	189	230	157	387	355	246	601
			10	....	36	36	....	71	71	122	149	271	242	233	475
			20	....	30	30	....	66	66	....	141	141	126	224	350
2268	3000	30	0	100	89	195	227	192	419	524	438	962	....	....	All
			10	....	81	81	...	176	176	263	390	653	602	708	1310
			20	...	73	73	....	158	158	....	353	353	285	608	893
3466	3000	88.25	0	60	42	102	122	88	210	250	178	428	390	272	662
			10	....	38	38	....	81	81	130	169	299	260	262	522
			20	....	34	34	....	72	71	....	160	160	125	252	377

D.—For 16-inch.

Weight of projectile..... .... 2370 lbs.

Range.	Muzzle Velocity.	Maximum Ordinate.	Altitude of Gun.	Danger Space in Yards for Heights of Target Given Below.								
				Trajectory.			Trajectory.			Trajectory.		
				Beginning.	End.	Total.	Beginning.	End.	Total.	Beginning	End.	Total.
				Height of Target 5 ft.			Height of Target 10 ft.			Height of Target 20 ft.		
2000	2300	27.503	0	108	94	202	217	202	425	493	500	993
			10	....	86	86	....	182	182	248	412	660
			30	....	68	68	.. .	148	148	....	320	320
4000	2300	128.21	0	41	42	83	88	81	169	79	160	239
			10	....	40	40	....	75	75	92	153	245
			30	....	38	38	....	71	71	...	144	144
2000	2800	20.058	0	147	136	283	302	288	590	880	815	1695
			10	....	120	120	...	246	246	380	586	966
			30	....	102	102	....	194	194	....	431	431
4000	2800	85.437	0	70	61	131	134	120	254	265	250	515
			10	....	60	60	....	115	115	128	240	368
			30	....	54	54	....	106	106	....	222	222



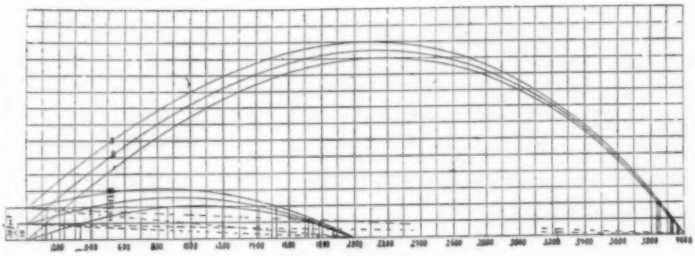
PROPOSED 16-IN. GUN.

Curves for muzzle velocities of 2300 and 2800 feet, illustrating losses in danger space when gun is placed 10 and 30 feet above sea-level. Full lines relate to the muzzle velocity of 2300, and broken lines to that of 2800.

E.—6-inch Bethlehem Gun, R. F.

Weight of projectile..... ..... 100 lbs.

RANGE.	MUZZLE VELOCITY.	MAXIMUM ORDINATE.	ALTITUDE OF GUN.	Danger Space in Yards for Heights of Target Given Below.								
				Trajectory.			Trajectory.			Trajectory.		
				Beginning.	End.	Total.	Beginning.	End.	Total.	Beginning.	End.	Total.
				Height of Target 5 ft.			Height of Target 10 ft.			Height of Target 20 ft.		
2000	3000	20.73	0	155	134	289	312	271	583	860	808	1668
			10	....	119	119	...	235	235	292	572	864
			20	....	100	100	....	203	203	....	460	460
4000	3000	110.20	0	56	39	95	116	80	196	228	160	388
			10	....	35	35	....	70	70	116	150	266
			20	....	30	30	....	65	65	....	140	140



CURVES FOR BETHLEHEM 6-IN. R. F. GUN.

For ranges of 2000 and 4000 yds., illustrating losses in danger space when gun is raised 10 and 20 ft. above level of the sea.

while the loss in danger space due to raising the gun above the sea level increases for the same reason. High power and flatness of trajectory go together, and loss of danger space increases with these two elements as the gun is mounted higher and higher above the target.

(4) The fourth one considered is the proposed 16″ gun for two muzzle velocities, 2300 and 2800 feet. With the first muzzle velocity and a range of 2000 yards, and an assumed height of target of 20 feet and gun 10 feet high, the danger space at

the end of the path is 412 yards, but falls to 320 when the gun is raised to 20 feet above the former position, or when about in the position it would occupy if mounted on a disappearing carriage. At a range of 4000 yards, under similar circumstances, the danger space falls from 153 to 144. For the muzzle velocity of 2800 the corresponding numbers are respectively 586 and 431 at 2000 yards, and 240 and 222 at 4000 yards.

(5) The fifth one considered is the six-inch Bethlehem rapid-firing gun which is under guaranty to give a muzzle velocity of 3000 feet, firing a projectile of 100 pounds. For this gun ten feet above the sea level and a range of 2000 yards, we have for a five, ten and twenty-foot target danger spaces of 119, 235 and 572 yards respectively. When ten feet higher, on a disappearing carriage, the danger spaces become 100, 203 and 460. For 4000 yards we have 35, 70 and 160, in comparison to 30, 65 and 150 when the gun is ten feet higher. Comparing the results relative to this gun at the sea level with the same for the 16″ gun it will be seen that for the 2000 yard range and muzzle velocity of 2800 for the latter gun, we have for the same three heights of target danger spaces of 136, 288 and 815, against 134, 271 and 808 yards for the Bethlehem gun. At 4000 yards the corresponding numbers are 61, 120 and 250 for the 16″ in comparison to 39, 80 and 160 for the other gun. This comparison clearly shows the greater flatness of the trajectory of the heavier gun and the greater relative sacrifice made by assigning such guns to elevated sites.

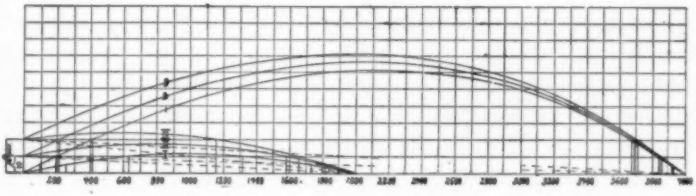
(6) The last one considered is the proposed four and one-half inch Brown Segmental Tube-Wire gun. An inspection of the table shows that for 2000 yards and targets 5 and 10 feet high the danger spaces are respectively reduced from 203 to 166, and from 453 to 359, and for a twenty foot target the whole range is danger space with several feet on the target to spare, but falls to 860 yards by raising the gun from ten to twenty feet above the water. The table and curves pertaining to this gun make it only too apparent how necessary in future it will be to keep all sea-coast guns down close to the water level.

These remarks apply particularly to ranges within four thousand yards where the decisive battle must be fought, and where in the excitement and smoke and for lack of time to de-

F.—4½ inch Brown Segmental Tube-Wire Gun.

Weight of projectile..... 55 lbs.

RANGE.	MUZZLE VELOCITY.	MAXIMUM ORDINATE.	ALTITUDE OF GUN.	Danger Space in Yards for Heights of Target Given Below.								
				Trajectory.			Trajectory.			Trajectory.		
				Beginning.	End.	Total.	Beginning.	End.	Total.	Beginning.	End.	Total.
				Height of Target 5 ft.			Height of Target 10 ft.			Height of Target 20 ft.		
2000	3910	11.43	0	250	270	520	628	692	1320	All	All	All
			10	....	203	203	...	453	453	All	All	All
			20	....	166	166	....	359	359	....	860	860
4000	3910	61.86	0	100	76	176	198	154	154	418	318	736
			10	....	71	71	....	148	148	214	300	514
			20	....	65	65	....	140	140	....	283	283



Curves showing loss in danger space for the Brown segmental-tube wire gun, when raised 10 and 20 feet above the sea-level. Ranges 2000 and 4000 yds.

termine distances, the range of a hostile ship must be uncertain and changing. In such cases flatness of trajectory and long danger space alone can compensate for these disadvantageous conditions and the number of hits will be in direct proportion to the length of the danger space.

The six, eight, ten and twelve-inch disappearing carriages mount their guns, on an average, about ten feet higher than the more simple barbette or pedestal mount. Assuming that ten feet is a reasonable superior limit for height of a barbette gun above sea level, a comparison of values for the same target and gun at ten and twenty feet above the sea, will give a good idea

of the relative hitting efficiency of the two classes of guns. This comparison reveals an enormous loss in hits due to the higher mounting of the gun on disappearing carriage. The efficacy of fire of the gun on low mount increases as the hostile ship approaches, while that of the gun on the high mount diminishes more and more as the range shortens, resulting in a great reduction in offensive power at the critical moment when most urgently needed.

The reader's attention is further invited to the long danger spaces at the beginning of the trajectories, and its diminution as the gun's altitude increases. It frequently runs out nearly to the summit and in many cases connects with the other branch, making the entire range danger space. This consideration is frequently omitted in treating the subject.

The greatest advantage in high power lies in the long danger space afforded by the gun. If the whole range of twenty-five hundred or three thousand yards is danger space, the gunner may set his sight for these ranges, aim at the water-line, and fire continuously without change of sight so long as the object does not exceed the danger space range, and the rate of fire becomes simply a question of loading the gun. To obtain this result gun-makers have constantly striven, and to mount the gun higher than is absolutely necessary is to sacrifice the principal advantage gained by the development of high power ordnance.

The writer is aware that thirty feet or more is by some considered necessary for height of mount on account of magazine requirements, but the execution of this idea and its practical application in our service have not as a rule been successful. The costly magazines constructed underneath the high parapets have as a rule been so wet and damp that they were unfit for storage of powder and projectiles, and it is doubtful if they can ever be made suitable for this purpose. In some cases they were abandoned after completion and temporary houses built for powder at considerable additional expense. From these well known facts it would appear better in future to commence magazine construction on a new and different basis, which would avoid the regular and conspicuous contour, and the other disadvantages herein presented. A little study and originality given to the subject it is believed would develop

designs of cheaper execution, giving the gun a lower position and engineering work in all respects simpler and better adapted to the requirements of the problem. There are but few positions which cannot be made to accommodate the gun at a height of ten feet above the sea. When this can be done greater height should not be permitted, even if legislation becomes necessary to prevent it. Any action that will loosen the bonds that still tie us to the past centuries and exact more modern methods to meet the problem as a new and original one will result in the highest benefit to the defense of the Nation.

III.—TACTICAL CONSIDERATIONS.

Disappearing guns are credited with the following advantages.

(1) The gun is exposed only during the firing. (2) The greater part of the personnel is permanently under cover and casualties will consequently be few. (3) Where guns are mounted in this manner no satisfactory reconnaissance can be made by the enemy.*

These advantages were the result of study many years ago and viewed in the light of conditions now existing demand qualification. The gun itself may be considered in danger while exposed, but with the gun as now mounted, aiming with the telescopic sight will take up considerable of the firing interval. Experience shows that at target practice aiming absorbs most time, and the question here involved is the ratio of this time to the whole time required to fire a shot. To illustrate, let it be supposed that five shots can be fired from a disappearing gun in five minutes and fifteen from the same gun on pedestal mount, and that during the five minutes the disappearing gun is exposed two minutes and the other gun the whole time. The time of exposure per shot fired is two-fifths of a second for the disappearing gun and one-third of a second for that on the pedestal mount. Though perhaps not apparent at first, the gun on pedestal mount is relatively less exposed than that on the disappearing carriage. The real efficiency of the disappearing gun in the case supposed would, for destructive work, be but

* "Defense of the Sea-Coast of the United States," Abbot, p. 94.

one-third that on the pedestal mount, to say nothing of the moral and material effect of the series of quick blows from the quick-fire gun.

In cases where concentration upon a gun or guns is made, the disappearing gun can withdraw and await cessation of the fire, while the barbette gun may be overpowered and destroyed. Such experience may happen to all classes of guns and must be borne by gun and detachment as one of the fortunes of war. Points on the line of battle are exposed to the same danger, but while some are hard pressed, others are more free to use their fire to greater advantage and push the issue home at such places as will serve the purpose of the general commanding.

The second advantage claimed for the disappearing gun is intimately connected with the first, and from what has just been said, it is clear that protection is a relative idea, and when the values of the two systems are measured by the results obtained, this claim of advantage must be taken with some allowance. Principles deduced before the era of rapid fire and similar improvements in artillery do not, without modification, apply to the present era of high power rapid-firing guns, smokeless powder, fixed ammunition, and quick-loading, aiming and firing devices.

During the late war with Spain there was much said on the subject of masked batteries. Under circumstances which may frequently arise in war the value of masked batteries to surprise the attacker at a critical moment is beyond question, a fact confirmed by the experience of General Abbot during the Civil War.* The method of mounting guns in the United States will scarcely justify any claim of advantage in this respect, since the coasts are lined with regularly formed parapets which, to one entering a fortified harbor, are amongst the most conspicuous objects presented to the eye. No military or naval officer would mistake their nature, reconnaissance would be clearly superfluous and no time wasted thereon.

Captain Benoit, French Artillery, writing on the bombardment of the forts of Santiago, criticises the Spaniards in the following words: "In the location of their improvised batteries the Spaniards were happily inspired, obviating traverses and

* "Defense of the Sea Coast of the United States," Abbot, p. 94.

earth-works, which by forming parapets, increase to a considerable extent the effect of projectiles upon the personnel of the battery. But they do not appear to have taken any thought of trying to conceal these batteries,—of too pronounced geometrical forms,—and to attract the hostile fire towards fictitious batteries, losing sight of the fact that the principal defense of coast batteries when face to face with the guns of the always visible ships, is in their invisibility." *

If this is his opinion of those fortifications, it would be interesting to know what he would say of our new works which have all the geometrical form and lack of concealment of those of the eighteenth century.

1. *Service of the Gun.*—The more massive and complex nature of the disappearing carriage introduces disadvantages into the service of the piece. The carriage, being many times heavier than the barbette mount, requires greater work of the cannoneers. The effect of this would be particularly felt where, in following a swiftly moving object, lively work becomes necessary.

Owing to the labor, principally that of retraction, drill with the disappearing gun is unsatisfactory. In a drill of one hour and a half the old 15″ S. B. could, on the average, be hauled from battery, loaded and fired about once. Years of this kind of resultless drudgery on the part of the artillery soldier had discouraged him, but with the advent of new guns and carriages he looked forward to an ideal set of conditions and expected machinery that would be up to the requirements of modern artillery. When, however, the disappearing carriage came on the scene it preserved the same slow back-breaking work of the old system, and produced the same fatiguing, interest-killing effect. The operation of withdrawing the gun from firing to the loading position on the new carriage was so similar to that on the old that some imagination was necessary to see any difference at all. To load, run into battery, fire, and go back to the loading position was about the best that could be done in the time allotted for drill, and such a result with a modern gun was not one to excite enthusiasm.

In the later models retraction is simpler and better, but even

* Notes on the Spanish-American War, Office of Naval Intelligence, p. 94.

in these drill at the guns is necessarily slow, tiresome, uninteresting and void of that life essential to efficacy in action.*

Instruction of cannoneers and officers can only be given through drills, which should as far as possible develop an efficient practical knowledge of the duties to be exacted of them in action, and if the drills fail in this respect they are of no particular value.

The limited amount of service ammunition available for target practice renders it imperative that subcalibre practice be introduced. This instruction, to be of value, must assimilate as closely as possible to the conditions of practice in action. The simple barbette carriage can be made to fulfill these requirements without difficulty, but the service disappearing carriage, as now constructed, without quick means of retraction, does not admit of a satisfactory solution of the problem.

The disappearing carriage loses in tactical efficiency in various other ways on account of delays inherent to the system. The more important of these are adjusting the shot trucks to the height of gun in loading position, which may vary from shot to shot; time absorbed in giving command for tripping, and time for tripping; hooking lanyard after the gun is in firing position; and climbing up to the trunnions and sighting the gun while in an awkward and inconvenient position and climbing down again. All these details may appear like trifles, but when they all act to delay the fire, the aggregate loss of time under present demands of quick-fire is serious and should not be tolerated. Such causes of delay are not found in any modern system of artillery, and one which admits them will not stand the tests of judgment by standards of the twentieth century.

2. *Rapidity of Fire.*—The slower action of the disappearing system affects the tactical question in matters, whose importance increases from day to day. Any doubt that may exist in the mind of the reader on this point will be dispelled on reading the Report of Major William Crozier, U. S. Volunteers, on the Inspection of the Sea-coast Fortifications of the North Atlantic Coast in 1898. In regard to this subject the Chief of

* Report of Inspection of the Sea-coast Fortifications of the North Atlantic Coast, Major William Crozier, U. S. Volunteers, 1898, p. 2.

Ordnance in indorsing letter written by General Miles above mentioned, writes as follows:

"Careful tests for rapidity of fire have been made with both barbette and disappearing carriages for 10-inch and 12-inch guns, showing that the rate for the gun mounted on the disappearing carriage is about double that of the gun mounted on the barbette carriage. This is explained by the fact that for the gun on the barbette carriage the heavy ammunition has to be raised to a considerable height and placed in the gun by cannoneers standing upon a small loading platform, while with the disappearing carriage the recoil of gun brings it down close to loading platform, where the operation of charging it can be performed with great rapidity and convenience. At a recent informal trial, made entirely without preliminary drill, five rounds were fired in one minute and thirty-two seconds from a 6″ gun mounted upon a disappearing carriage. The only increase of the time between rounds of the gun so mounted and the rapid-fire piece upon an ordinary barbette carriage mount is that required for the gun to rise from the loading to the firing position, which is about six seconds, so that the five rounds would have required for the latter style of mount about one minute of time. The rate of five rounds in a minute and a half is, however, believed to be about as fast as a cannoneer can aim a gun of this size."*

The above reasons for the superior rate of fire with the disappearing gun are not such as will satisfy those familiar with the circumstances. The competitive test is hardly a valuable one since, in order to prove their efficiency, we do not expect to compare the gun and carriage upon which we stake the nation's safety with inferior or obsolete designs.

In this test the loading facilities were different and the result is simply a comparison of the two systems of loading. Had the test been in competition with the old 15″ smooth bore, where time, strength, good luck and fair weather were the principal considerations for success in loading, instead of the barbette gun, the relative rapidity of fire would have been much more pronounced and instead of two might have been as high as ten, twenty or even fifty. If the above claimed superiority

*Report of Chief of Ordnance, 1900, pp. 303-304.

in favor of the disappearing gun be due to the inferior loading appliances of the barbette carriage, would it not be a good idea to improve the latter and provide it with the best appliances and a loading platform "where the loading can be performed with great rapidity and convenience?"

It is assumed that the six-inch disappearing carriage is intended for rapid fire since all other mounts for this calibre are obsolete.

The idea of mounting a rapid-firing gun upon a disappearing carriage is a new one in the development of artillery science, and the United States is the first country to present it. In relation to the question of mounting small calibre guns on this kind of mount the Chief of Engineers in 1900 writes:—

"While a considerable number of six-inch guns have been mounted on disappearing carriages in foreign services, the application of the disappearing principle to rapid-fire guns has never been favored by the Engineer Department, some form of eclipsing mount such as the balance pillar or pedestal mount being considered preferable. Disappearing carriages for six-inch guns have never been asked for by this Department, although 29 emplacements for this type of carriage are now under construction to meet the number of carriages reported officially by the Chief of Ordnance as under manufacture." *

General Miles, writing to the Secretary of War under date of April 26, 1900, in his letter closing the gun carriage controversy, writes as follows:—

"It will be noted that the statute thus creating the Board of Ordnance and Fortifications, and providing funds for beginning the work of national defense on a scale commensurate with its importance, clearly intended that the Board should have direct supervisory control, under the Secretary of War, of the entire project."

The accompanying endorsements of the Chief of Engineers and the Chief of Ordnance, with the attached memorandum prepared by the latter, apparently show that in carrying out this great work from year to year no such control or supervision as Congress contemplated has ever been recognized by either bureau.

* Report of the Chief of Ordnance, 1900, p. 317.

"The responsibility for the present conditions is therefore definitely fixed." *

These quotations show that the Ordnance Department originated the idea of placing the six-inch gun on a disappearing carriage, and that upon this Department must fall the responsibility for its unsuitability and short-comings.

In order to present more clearly the present status of artillery rapid fire and its tendencies toward the future, a slight digression here becomes necessary. The following data taken from various sources will elucidate the question and place it before the reader in such a way as to leave no possibility of doubt.

Table showing Relations Amongst Changes in Azimuth, Range, and Speed of Vessel in Miles per Hour, for one Minute, in either Direction from the Foot of the Perpendicular through the Gun upon the Course of the Ship, and also for Ship Moving in Circular Arc.

Speed of Ship in Miles Per Hour.	Perpendicular Distance in Miles to Course.	Changes in Azimuth.	
		Straight Course.	Circular Course.
Twenty Miles.	0.5	33°.7	38°.2
	1.0	18°.4	19°.1
	1.5	12°.5	12°.7
	2.0	9°.5	9°.5
	2.5	7°.6	7°.5
	3.0	6°.3	6°.4
Twenty-five Miles.	0.5	39°.8	47°.8
	1.0	22°.6	23° 9
	1.5	15°.5	15°.9
	2.0	11°.8	11°.9
	2.5	9°.6	9° 5
	3.0	7°.9	7° 9
Thirty Miles.	0.5	45° 0	5?°.2
	1.0	26°.6	28°.7
	1.5	18°.4	19°.1
	2.0	14°.0	14°.3
	2.5	11° 3	11° 5
	3.0	9°.5	9°.5
Thirty-five Miles.	0.5	49°.4	6?° 9
	1.0	30°.3	33° 9
	1.5	21°.3	22°.3
	2.0	16°.3	16°.7
	2.5	13°.1	13°.4
	3.0	11°.0	11°.2
Forty Miles.	0.5	53°.0	76°.4
	1.0	33°.7	38° 2
	1.5	24°.0	25°.5
	2.0	18°.5	19°.1
	2.5	14°.9	15°.3
	3.0	12°.5	12° 7

The accompanying table was computed for the purpose of showing the necessity for rapid-fire, particularly with small and medium calibre guns in coast defense, and the conditions which

* Report of Chief of Ordnance, 1900, p. 328.

must be fulfilled by the same in order to obtain satisfactory results. Column (1) shows the speed of the attacking vessel, (2) the perpendicular distance to the vessel's course, and columns (3) and (4) the changes in azimuth for one minute on straight and circular courses, respectively, origin of azimuths at the perpendicular to the course.

The third and fourth columns show that a torpedo boat or other swift vessel may in one minute pass over an angle of 53° or 76.°4, depending on the straight or curved path followed. At the distance of one mile from the gun these numbers, for forty miles per hour, become 33°.7, 38°.2 respectively. The six-inch gun on disappearing carriage in the informal test fired at a rate of one shot in 18.2 seconds, which for simplicity may be taken as three shots per minute. The table shows that even at the slower speeds and longer ranges the target would pass over appreciable arcs between shots fired with this interval, and that at the higher speeds and short ranges the gunner, between shots, may easily lose the target entirely.

The reader will readily see the difficulty of obtaining efficacious fire against such an object with the six-inch disappearing gun. This problem has been carefully studied by all prominent gun makers, and all have developed satisfactory devices for its solution. These devices consist in such machines and apparatus as conduce to the greatest rapidity in loading, aiming and firing, and in making these three operations, as far as possible, independent of one another. The following quotations show to what extent the above-named requirements have been embodied in modern gun-carriage construction :

" The first elements in the success of the Japanese were undoubtedly their superior scientific training, organization and discipline, without which the finest weapons cannot count for much. But after due account has been taken of these qualities, the victory of Japan on the sea must be attributed chiefly to the wise foresight of her naval authorities in arming their ships with quick-firing guns. One gun of this type represents a battery of several guns of the old type, and as now constructed by us their range and penetrative power are unsurpassed. The Japanese, in regard to armament and naval material, kept themselves not only abreast, but, if anything, ahead of their times,

and recognized the value of the modern weapons as utilizing to the utmost the higher velocities and lower trajectories rendered possible by the use of cordite. This increased power of guns enabled them to operate at a distance too great to permit of effective reply. The carriages of these guns also deserve some special mention. They are highly finished scientific instruments, utterly different from the rough wooden carriages in vogue not so very long ago, which required twelve or fifteen men to manœuvre them. Guns of ten or twelve tons' weight, that no one would have thought of placing on board-ship at all, can now be trained and elevated easily with a single hand, and, in spite of what might be supposed to be the delicacy of the contrivance by which such results are obtained, no single carriage was disabled in the late war except by a direct hit." *

SUMMARY OF THE RECENT PRODUCTS OF THE SHOPS OF VICKERS' SONS & MAXIM. †

Calibre in inches.	Length in Calibres.	Muzzle Velocity.	Weight of Gun.	Weight of Shield.	Weight of Mount Complete.	Rounds Per Minute.
4.″724	40.	2600.	5600.	8740.	13004.	12.
4.″724	45.	2600.	6048.	8740.	14000.	12.
6.″	40.	2530.	15160.	8960.	19600.	8 to 11
6.″	45.	2775.	16620.	8960.	20720.	8 to 11
8.″	45.	27500	42388	‡14680.	36736.	5.

This company has recently developed a seven and half inch gun which throws a 200 pound projectile with a muzzle velocity of 3000 feet, with a rate of fire of six shots per minute. ‡ In a test on June 18, 1901, this gun gave a rate of eight shots per minute. Their 9.2″, 10″ and 12″ guns have different rates of fire depending upon the mounts used, but all are provided with appliances suited to give them great rapidity of fire. Their 12″ guns constructed for battle-ships are provided with loading apparatus, which permits loading at any angle of elevation or training. The gunner may constantly aim his two pieces and

* Sir William Armstrong, for *American Engineer and Railroad Journal*, Nov. 14, 1895.

† *Journal U. S. Artillery*, No. 33, 1898, p. 68.

‡ Dawson on War Material, *Journal U. S. Artillery*, No. 49, 1901, pp. 344-5.

upon completion of loading fire one or both, as he deems advisable. Ammunition is continuously brought to the loading cage, which travels around with the breech and automatically kept in position relative to the axis of the gun during the movements of the mount in aiming. The system lends itself well to the requirements of quick-fire, and two shots per minute can easily be fired in practice.* In fact, in a test made in April, 1900, two shots were fired in fifty-one seconds. These mounts are provided with loading gears which are almost automatic, and duplicate automatic sighting devices for each gun. †

"This much we learned during the war. We learned also the great value of rapid-firing guns and above all we learned the paramount importance of accurate fire." ‡ "Admiral Montojo in his report says: 'The Americans fired most rapidly. There came upon us numberless projectiles.'"

The same writer continuing says concerning the battle of Manila Bay and the splendid condition of the U. S. fleet afterward:—

"These wonderful results were obtained entirely by our superior skill in pointing and firing guns rapidly. The destruction of the Spanish fleet off Santiago again demonstrated what can be accomplished by rapid firing and accurate pointing." ‡

"For many years the rapid-fire gun has been growing in importance, and European nations are making important changes in their armaments to extend their use. Target practice has also acquired new life, and the principal naval powers are largely increasing their allowances of ammunition for it." ‡

In 1889 the Swedish government, in guns for their navy, required a rate of fire of six and three shots with war ammunition for the 15 and 21cm. guns respectively, showing that even small nations of Europe look upon rapidity of fire as the first consideration.

Passing now to our own country we find firms which are now constructing guns and carriages up to modern stand-

* Dawson on War Material, *Journal U. S. Artillery*, No. 49, 1901, pp. 344-5.

† Notes on Naval Progress, Office of Naval Intelligence, 1900, p. 146.

‡ Commander William H. Driggs, U. S. Navy: Notes on Naval Progress, Office of Naval Intelligence, 1899.

ards. The Bethlehem Steel Company have agreed, under contract, to make for the Board of Ordnance and Fortifications a six-inch rapid-firing gun on pedestal mount with shield, which will give a muzzle velocity of 3000 feet and fire a 100-pound projectile eight times per minute. At the proving ground, Indian Head, the 8″ naval gun with Haessler mechanism, starting with the gun loaded, gave a rate of fire of six shots per minute, and the same department is now building a 7″ quick-firing gun for use against the latest improved armor. *

The same results appear if we examine the recent product of the firms of Armstrong, Krupp, or Schneider-Canet. All tell the same story, which is that every effort has been and continues to be made to increase the rapidity and accuracy of the fire.† No matter which way we turn, everywhere except in our army, are found quick-loading, quick-aiming and -firing guns, not for small calibres alone, but for six, seven, eight, ten and twelve-inch guns. All the important gun constructors long ago recognized the importance of rapid fire, and even Japan, seven years ago, won her first great war with this class of guns.

The few facts here cited not only show the present state of development of the quick-firing gun, but, what is more important to the United States, they unfold future tendencies in a way that leaves the probabilities thereof quite unmistakable. The modern gun-maker does not construct mounts for guns which take six seconds to pass from the loading to the firing position, well knowing that such a design could never be sold. Instead of wasting it he counts upon firing one shot in that interval; he fights for every fraction of a second in trying to reduce his firing interval and increase his rate of fire, and banishes from the mechanism of his carriage unncessary movements of every description.

The loading interval for the six-inch disappearing-gun should be the same as for any other gun of the same calibre and breech mechanism. According to the test the firing interval is about 20 seconds, and since the modern quick-firing gun of this calibre can be loaded and fired in from six to eight seconds, it

* Proceedings U. S. Naval Institute, No. 96, 1900, p. 679.

† For complete discussion of the subject see The Naval Annual, 1901, Brassey, pp. 424–36.

XUM

follows that from ten to twelve seconds are absorbed by the disappearing gun in going into battery, and in finding and aiming at the target. This lost time cannot be other than fatal to quick *fire-action*; in the meantime the gun suffers exposure which, per shot delivered, is about twice as long as in the case of the simpler and more economical mount, which fires three times as fast and in offensive value is equivalent to three disappearing guns and three detachments.

These results demonstrate that the terms disappearing and rapid-fire gun are contradictory in nature and cannot be logically used together. It would appear therefrom that the policy which adopted the disappearing carriage for the six-inch gun resulted from a grave misconception of the question.

It may seldom be necessary that a gun should fire its maximum rate,—perhaps but once within its life or period of usefulness, but when such demand is made the gun must respond quickly and deliver the shots as required or fail in its purpose. These remarks apply with great force to the larger calibres. They will not as a rule be called upon to fire at their highest rate, but at critical moments, when circumstances are favorable, and the demand for quick fire urgent, the gun must come up to the requirements of the occasion, or the day and the battle may be lost and with them all that goes with the position.

This is the most important question confronting artillerists to-day and cannot be passed over lightly. Compare our 8-inch gun on either carriage with the Armstrong gun of the same calibre, on barbette mount, with electric or hand training gear for the gunner, who can keep his eye on the target, elevate and traverse at will and fire from four to six times per minute, or with the 8-inch naval gun which is mounted so as to secure a speed of six shots per minute.*

The remark of the Chief of Ordnance touching aimed shots, it is believed, is based upon a misconception of modern artillery fire. The present standard muzzle velocity for six-inch guns is 3000 feet, with a projectile weighing 100 pounds. For the shorter and more advantageous ranges, the trajectory is flat, and with a low mount the danger space is correspondingly long.

* *Journal U. S. Artillery*, Vol. 4, 1895, pp. 341-47, and Proceedings of U. S. Naval Institute, No. 96, 1900, p. 679.

To obtain this result gun-makers have been struggling for the last twenty years. The more danger space the better since the gunner, when once he has determined his range, is for a series of shots relieved from adjusting his sight and can devote his mind and energy to following the target and firing as rapidly as possible. Lieut. Colonel Rocchi, Italian Engineers, in a full discussion of the Coast Artillery problem says:

"The characteristic advantage of rapidity of fire results from the fact that the interval between shots is so very small that it does not permit ships, even with high speeds, to change the essential conditions of vulnerability with respect to the front of the battery. When once the target has been hit many other hits will follow, until, by its change in position, shots fall 'short' or 'long,' the fire will be corrected by trial and the beginning of a new series of shots determined." *

The foregoing presentation of the subject treats largely of guns and mounts constructed for ships, but most of them, particularly the barbette and pedestal mounts, apply equally well on shore.

Although the construction and armament of war-ships embrace the fulfillment of many other requirements, they are built and equipped primarily to fight ships and in this respect are like coast batteries. The latter should have essentially the same armament, which, existing under simpler conditions, should make the solution of the fortification problem easier. The fire of guns of the coast-batteries are the principal consideration in the coast armament, and always directed against ships; allowing for the easier conditions with respect to their mounts, those mounts fulfilling the same ballistic and tactical requirements should be best suited to the shore defense.

Study of the armaments of ships will teach valuable lessons relative to this subject and should become a powerful aid in establishing correct principles for the solution of the problem.

The data presented above to illustrate the ballistic and tactical principles essential in modern gun-carriages, not only reveal the present status of the question, but indicate what must be expected within the next few years. Their teachings are as clear as day. It can scarcely be doubted that by the end of the

* *Rivista di Artiglieria e Genio*, February, 1900, p. 201.

present decade we shall be dealing with muzzle velocities exceeding the present standard for quick-fire guns by at least 1000 feet, just as the latter exceeds that of ten years ago by the same amount, and that due to redoubled effort in the development of quick-loading, aiming and firing guns, the present rates of fire will be materially increased and these different operations made wholly independent of one another. Owing to the resulting development of power in the smaller calibres,—the immediate field for future development,—the number of larger calibres will be greatly reduced, if not entirely supplanted by equally powerful guns of smaller calibres.

On this point there seems to be no reason for doubt, and the defense must, at the critical moment, if the attack be pushed home, depend upon its rapid-firing guns to prevent the enemy from attaining his object. Under such circumstances the rapid-firing guns will be taxed to their utmost to avert disaster, and this time at least, if never again, they must fire rapidly, accurately, and continuously.

(*To be concluded in next number.*)

REDUCTION OF PAPER WORK IN THE COMPANY.

"The paper work in the Army, as in the Navy, should be greatly reduced." *

By Captain WILLIAM C. BROWN, 1st U. S. Cavalry.

FEW acquainted with the subject will deny that this criticism on our Army business methods is an eminently just one.

The hands of officers of all grades are tied down by methods, some of which are alike antiquated and ridiculous, retarding progress by taking up valuable time which should be put to more important uses.

If the views of officers—each in his particular sphere—could be obtained on this subject possibly something might be evolved which would effect this much desired reduction; this at least must be my apology for airing mine from the standpoint of the company commander. The writer is far from thinking that the suggestions made are the best; he feels confident, however, that they point out an improvement on what we have, and feels certain that if the matter be taken up by others of longer experience, a reduction can be accomplished in paper work which will be well worthy the efforts made to this end.

The aggregate amount of clerical work performed in companies is enormous, there being now, in the reorganized army, something over 700 organizations; even lessening the labor a small degree in each will effect a great saving of labor in the army as a whole.

If the clerical labor could be distributed through the company, like duties performed by roster, the inconvenience would not be so great, but unfortunately the lion's share of it comes on the company commander and first sergeant—the hardest worked men—whose time should be mainly spent in administration, instruction and discipline.

We have company clerks, it is true, but if one who is so for-

* President Roosevelt's Annual Message.

tunate as to secure one who is thoroughly accurate and reliable, and has a thorough mastery of the intricate system of company records, rolls and returns, he is usually entitled to and secures promotion which gives him something more than a private's pay. A non-commissioned officer *ought not* to be placed on purely clerical duty, but with most of us it is absolutely necessary at times to make such details.

In twenty-five years service—a large part of it as a troop commander—the writer can only recall having had one private who was in every way a *perfect* company clerk—one who could (and did) make out a muster roll of 100 names, with a remark of some kind after every name, and all without an error. He was such a marvel, as clerks go, that it is needless to say that when his time expired everything in my power was done to retain him ; but as he would go, I applied in his behalf and he was given an appointment as a War Department Clerk at $75 a month.

Let us now consider some of the more important books and papers to be kept and prepared in a company commencing with—

LETTERS SENT.

The laborious method of copying letters in a large record book seems entirely out of date, not only requiring unnecessary time and labor, but is inaccurate as well, and was discarded for the Letter Press Book by the Quartermaster's Department in 1894 (see G. O. No. 14 A. G. O. 1894).

It may be said that we cannot carry letter presses in the field, which is true, but a Bushnell's Letter Copying Book of 150 pages can be purchased for one dollar or thereabouts, weighs about 12 ounces, and letters can be copied by the merest novice without the aid of a press. This can be carried in the field when it would be impossible to carry the large record book now supplied for recording letters sent. The index should be bound with and be a part of the Letters Sent Book, instead of a separate volume as now furnished.

LETTERS RECEIVED.

The first and second columns, viz. : that headed "*Date of Receipt and File Number*," and that headed "*Name of Writer*,"

are wider than necessary; the first column should be about one-half the present width, and the second about two-thirds the present width. The space so gained should be thrown into the third column, which is entirely too narrow, as the examination of any completed book of Letters Received will show.

CLOTHING ACCOUNTS.

The regulations and orders in force on this subject make the matter of keeping the soldier's clothing account exceedingly complicated. The system is admirable if viewed from the standpoint of the expert arithmetician; for no doubt if accounts *were* accurately kept (which they are not) the soldier would get just what he is entitled to, and the Government would pay only what is contemplated by law and no more. No account seems to be taken of the limited capacity for such work which is found in the men who have to do it.

One source of difficulty is that orders announcing the price of clothing, with money allowance for clothing of enlisted men, are frequently issued taking effect on other dates than July 1st and January 1st. June 30th and December 31st are the dates on which, by paragraph 1304 A. R., all men of over six months' service have their clothing accounts settled. When clothing allowances are changed to take effect on other dates than July 1st and January 1st it necessitates extra work in computation. See G. O. No. 106 A. G. O. 1901, which took effect October 1st last.

Another requirement of the clothing order which entails much extra work and liability to error, is that where the figures designating the allowances per day are given they are carried out to fractions of a cent. The additional mathematical accuracy thereby secured by no means compensates for the extra time and labor involved; besides this the chances of errors are greatly increased.

It is thought that it would be far better to carry out these figures only to cents.

The cost of the brass letters and numbers on campaign hats —1 cent each—is not commensurate with the clerical labor in accounting for these articles, and it must be remembered that the increase in number of items to be accounted for increases the liability to general errors in clothing accounts.

The writer recently made application to purchase about 200 brass letters and numbers, on certificate that they were for use of men in his troop, but the application was refused on the ground that the Army Regulations do not provide for sales to officers except for their personal use. Suggestion is made that the Regulations might well be amended to permit sales of such small articles as a captain might certify to be for the exclusive use of men of his company.

It is surmised that the attempt to make everything conform to the "Allowance of Clothing in Kind" (aggregate cost of same constituting the annual money allowance of the enlisted men), see page 17 G. O. No. 106 A. G. O. 1901, is the cause of much of our trouble. Doubtless that is made in pursuance of Section 1296 R. S. (Par. 749, Military Laws of U. S.) but this is not mandatory, as this law reads that "The President *may* prescribe the uniform of the Army," and the following of this allowance table is, by company commanders, more honored in the breach than the observance. For instance, my troop has been at this post since October, 1898, under garrison conditions, but no full-dress uniform has been drawn or worn; rarely any boots are issued. Men do require, however, more than prescribed of several of the other articles on the allowance table as gauntlets, underclothing, etc.

Non-commissioned officers, cooks, farriers and blacksmiths, artificers and musicians receive slightly larger clothing allowances than privates, so that there may be some 9 or 10 different allowances for the company clerk to consider in keeping clothing accounts. This *very greatly* increases his labor and liability to mistakes. The extra time required in computation due to this variety of allowances amounts to far more than the money value concerned.

By the present system the soldier receives, roughly speaking, about $60 worth of clothing in the first six months, and the greater part of this is usually drawn shortly after enlistment. If he deserts immediately after drawing clothing, this is usually lost to the Government anyhow, for if he has not disposed of it, his comrades usually get it before it can be secured by the 1st sergeant to be turned over to the quartermaster. The advantages of the present method would be retained if the soldier

were allowed a certain amount of clothing at enlistment, to be known as "*Enlistment Clothing*," though if not needed it should not all be issued at enlistment, and in fact he should have a credit for such articles as he does not require at all; as in the case of men reënlisting, who frequently are amply provided. Commencing then on the first day of his enlistment let him have a fixed rate per day to extend through the remainder of the fiscal year in which he enlisted. This daily allowance should not be carried out to fractional parts of a cent.

Changes, to take effect at the beginning of each fiscal year, should be made only when the aggregate cost of clothing for the new fiscal year differs so greatly from that in the current one, as to entail—if change be not made—material injustice to the soldier or considerable loss to the Government. The great *aggregate* amount of labor imposed upon company officers, first sergeants and clerks by a change in clothing allowances should always be considered, remembering that a small loss to the soldier or to the Government is preferable to making a change.

Non-commissioned officers, cooks, artificers, wagoners, and musicians and privates should have the same allowance. It is granted that their clothing does not cost exactly the same, but the difference is slight and not sufficient to warrant having different allowances.

It would be better to make a gratuitous issue of chevrons, stripes and such parts of their uniform as serve to slightly increase the cost. The money allowance for all should be the same.

No complaint is made that the clothing allowance is not sufficiently liberal. If the amounts due the U. S. for clothing overdrawn, secured from pay-rolls and final statements, be subtracted from the amounts annually paid soldiers for clothing money due on discharge, I venture to say that the balance paid the soldier will be found to be a large one. If it be thought that the carrying out of the suggestions made above will increase the annual bill for clothing the army, we could bear having these allowances slightly reduced for the sake of greater simplicity in the keeping of accounts.

Not all first sergeants and company clerks, and indeed not

all company commanders, seem perfectly familiar with making up clothing accounts, and one or two examples worked out and illustrating every variety of case liable to arise in service migh to advantage be printed, together with full and detailed instructions, on a fly leaf of the Clothing Book.

CLOTHING LIST.

In my own troop I have had for years a copper plate properly mounted to print the following:

Fort 189

I respectfully request my troop commander to draw the following clothing for me which is necessary for my equipment.

No.	Articles.	Size.	Value.
	Blankets woolen		
	Blouse made		
	Blouse unmade		
	Boots sewed		
	Cap forage		
	Cap fur		
	Ornaments		
	Chevrons cloth		
	Coat canvas fatigue		
	Coat summer		
	Coat uniform made		
	Collars		
	Drawers canton flannel		
	Drawers knit woolen		
	Gauntlets fur		
	Gauntlets leather		
	Gloves berlin		
	Hat campaign		
	Helmet felt complete		
	Leggings		
	Overalls stable		
	Overcoat made		
	Overshoes		
	Shirts D. B. flannel made		
	Shirts muslin		
	Shirts cotton under		
	Shirts woolen under		
	Shoes calfskin		
	Stable frocks		
	Stockings cotton		
	Stockings woolen		
	Suspenders		
	Trousers canvas fatigue		
	Trousers made		
	Trousers unmade		
	Trousers stripes		

Page Name

Blanks are readily printed from this by the troop clerk, and men desiring clothing fill them out and hand them to the first sergeant.

The sizes desired are thus not forgotten and the advantage of having such applications made on a neat printed blank is apparent. One of these plates would be sufficient for each post, and should be in the hands of the quartermaster.

The instructions in the Soldier's Hand Book require that first sergeants enter the amount allowed for clothing in each man's book in the appropriate place after the annual price list is received.

As all our men are now required before enlistment to be able to read and write, it would seem that they should be required to do this themselves — the first sergeant simply giving them the correct data by posting it on the bulletin board.

THE CLOTHING SCHEDULE

is not satisfactory, being wider than necessary. Suggestion is made that it could be made narrower by omitting on the blank all reference to sizes of blouses, as all sizes are of the same price, and the size can be entered in red ink if desired, for convenience when clothing is drawn. Helmets are usually drawn complete, and the heading "Helmet Trimmings" need not take up space on the schedule. When they are drawn, which is seldom, they can be entered under appropriate written headings at the end of the roll.

To assist the eye in readily catching the proper column, the abbreviations of the headings in the finest type (brilliant) might be printed horizontally in the appropriate places at the foot of the roll.

THE CLOTHING BOOK

is provided with headings under which to enter the several articles drawn at each issue. This entry is unnecessary as this data can easily be obtained from the clothing schedules, which are original records, and kept on file in the company.

MUSTER ROLLS.

Immediately after the column headed "Rank," should be a column headed,

"Present at date of Muster—Yes or No."

To indicate the fact of the man's presence or absence it would then be necessary to write only "Yes" or "No" in this column opposite his name—something quite as effective as, and much easier than, writing out the man's name.

Why it should appear after each man's name that he enlisted for a period of three years when that is the law for the Regular service is not known, but if it is necessary that this information should appear on the roll, why not add to the company commanders Certificate at the end of roll the words, "All men whose names are borne on this roll are enlisted for three years," or words to that effect, and let this take the place of the separate entry after each man's name.

Company clerks, as we all know, now have to make out at the end of August, October, December, February, April and June no less than five rolls, viz., two Adjutant General's Rolls

(one to be retained) and three Paymaster's Rolls (one to be retained). Some years ago we used but one blank form for this, and although we use two forms now, no doubt a single one could be devised which would answer all requirements as formerly. At the end of July, September, November, January, March and May we have the three Paymaster's Rolls to make out. This work at the end of each month is, with the other papers required, a serious tax on the company clerk, and 70 per cent. of this work on the rolls is mere copying which might be done by mechanical processes with the additional advantage of saving time in comparing rolls. This might be done in this manner: Let the one form, to be made up so as to answer for both the Pay and Adjutant General's Department and the roll be printed on, say two large sheets (one side only) of bond or similar tough semi-transparent paper something like the paper used for muster rolls some twenty years ago. The type used should be a bold faced type, preferably gothic. The roll should be made out in India ink which, in liquid form, is now an article of commerce—very fair results can be secured with any good black ink; but India ink is preferable. The copies having been made out and verified by the company commander, should now be sent to the adjutant's office, where a "blue printing" frame and paper should be kept by the sergeant major, under whose supervision the necessary copies could be printed.

The duplication of copies by this process should not be obligatory, for a series of cloudy days about the first of the month might interfere with "blue printing"; but here we would be no worse off than we are now, and the same forms could be used for making manuscript copies when, for any reason, "blue printing" is not practicable.

One *can* write on a blue print with a good black ink, but the figures are not clear where the print is overdone, and the last few vertical columns in which the paymaster enters the figures relating to the soldier's pay should be kept from the action of the light by placing over that part in printing, a sheet of paper (preferably black). If, however, the whole sheet be blue printed, the parts mentioned may be bleached, laying on the print a piece of blotting paper, of proper size, saturated with a

solution of common baking soda. The *original* manuscript (not "blue print") copy of the bi-monthly muster and pay-roll should go to the Adjutant-General. Both the paymaster's rolls on the even months would be "blue prints." On the odd months—the Adjutant-General not requiring a roll—the paymaster would get one manuscript and one "blue print" copy. The retained roll in the company would always be a "blue print."

It is presumed that we are coming to the days of large posts, and at each a soldier could, for the first five days of each month, be usefully employed in blue printing work as above described, as well as making similar copies of monthly returns and other papers, which by use of proper blanks, could be easily, accurately, and quickly duplicated, saving a large amount of clerical labor.

One of the causes of inaccurate rolls now is that at the end of the month, two months, or quarter, all the work comes in at once. Fifty per cent. or more of this is purely copying, but it tires the clerk out and leads to errors, just the same as in preparation of original papers. Let all effort be concentrated on *one* paper before it goes to the blue printing room, and increased accuracy will result. The labor of comparison of rolls and returns, together with the errors which creep in, in making copies, also disappears. The blue prints are permanent.

This of course applies to many other returns which are required and which are not mentioned here.

It would assist in the preparation of muster and pay-rolls and contribute to their accuracy, if the instructions printed on the cover were revised and made more complete, containing information set forth in some of the printed models which have been furnished. Such instructions as we find on these blanks as, "charges for transportation and subsistence while travelling will be made as prescribed in Cir. No. 15 A. G. O. 1892," are frequently valueless for the reason that few companies in the Philippines and no volunteers have files of orders dating anywere near that far back. By condensing and use of smaller type these instructions can be made more detailed and complete and reference to authorities not in the hands of companies in the field avoided.

XUM

EXPENDING FIELD EQUIPMENT.

After some years of experience with table ware company commanders have finally been permitted to expend each quarter a certain per cent. of such dishes as are liable to be broken, which fact suggests a similar measure for the field mess kit—articles particularly liable to loss and damage; the cost of these are small, being canteen 53 cents, meat can 28 cents, cup 15 cents, knife 7 cents, fork 5 cents, and spoon 2½ cents.

The writer has inspected, condemned and caused destroyed in the Philippines worthless articles of this kind which had been brought there from Alaska for the reason that in Alaska no inspector happened to be available. The cost of transportation of this worthless junk was no small item, let alone the trouble of caring for it until it could be regularly inspected, condemned, and dropped from accountability.

The following is suggested:—

In rendering his Return of Ordnance stores, at the end of each quarter, permit a company commander to expend and drop from his return such of the above articles as may have been unavoidably lost or worn out in field service, not to exceed certain limits. The percentage which he can expend should be based on the greatest number of men in the company during the quarter and should not exceed the aggregate money value of say the following: Canteen 7 per cent.; Meat cans 4 per cent.; Cups 5 per cent.; Knives, Forks and Spoons, 15 per cent. each. This would amount to the comparatively trifling sum of $7.76 per quarter for a company of 100 men. The clerical labor of charging up such articles would alone amount to more than this. The company commander should be permitted—having ascertained the money value of all the articles which he might drop in this manner on his list of expenditures—to drop not to exceed said money value, so that if he has saved on one item he can expend more of another. To the usual certificate on the list of Expenditures should be added "the articles of mess furniture above mentioned which have been dropped by reason of having been worn out, have been destroyed in my presence, those dropped or lost have been lost in field service." The company commander thus becomes his own Inspector on the class of Ordnance stores which in the field wear out rapidly and

which to carry along simply to be acted upon by an Inspector, becomes a burden and what is more important, the captain and 1st sergeant—both busy men and having many matters of detail to attend to—are at the end of each quarter enabled to drop and get rid of the articles of Ordnance most frequently brought before an Inspector. The money value of property thus made expendable is quite limited. If the value of the property worn out exceeds the money allowance above described, the excess is to be put on regular Inventory and Inspection reports as heretofore. If the extremely rigid accountability for property be thus modified, it is believed that company commanders will be more disposed to keep on hand a small surplus of such articles as constantly need replacing and so keep their companies more fully equipped. Fear of having to pay for property lost, sometimes cause company commanders to be careful to excess. At one inspection I found all the small-arms oilers (price 4 cents each) locked up in storeroom, the reason given being that when issued out to the men they were constantly being lost.

Troop and Light Battery commanders should in like manner be permitted to drop at the end of each quarter, particularly when in the field, a small proportion of such articles as halter straps, coat straps, stirrups and straps, spur straps, horse brushes, etc., the underlying principle in all this being to make expendable those articles—particularly small ones easily lost—which are constantly being lost and which have but little value. If thought desirable, provision might be made that all such lists be submitted to the commanding officer for approval, as a check on officers disposed to expend property too liberally.

FINAL STATEMENTS.

If *final statements* were printed in copying ink one could be press copied and the resulting copy sent to the paymaster to avoid payment on fraudulent discharge papers, in lieu of the manuscript letter now required to be written by the company commander by paragraph 166 A. R. The check on fraudulent papers would be perfect and labor saved as well.

This blank might be shortened some 3 inches by omitting all reference to pay detained under court-martial sentence, this having been rendered inoperative by G. O. No. 25, A. G. O. 1894.

Such blanks as:—Certificates of Disability for Discharge, Descriptive Lists, Ordnance Requisitions and Monthly Returns (unless the latter blank be prepared with view to copying by blue print method above described) and probably others should be prepared so as to be not more than 10×12 inches in size, and printed in copying ink so that one copy after being filled out could be press copied in the Letters Sent press copy book.

So far as practicable in the preparation of blanks all requirements of Regulations and General Orders relating to the paper concerned should by appropriate headings be brought to the attention of the officers whose duty it is to prepare it.

For example:—Under the heading *Military Record* on the back of the Discharge Certificate should be printed the words: "Continuous service at date of discharge —— years, —— months, —— days."

Also "Service, honest and faithful. Service not honest and faithful (erase words not used)."

With this before him in the preparation of discharge certificates the company commander is less liable to overlook the requirements of par. 162 A. R. and par. 164 A. R. as amended by G. O. No. 140, A. G. O., 1901.

Rubber stamps effect a very great reduction in the paper work of a company, but they should be supplied by the Quartermaster's Department as they are exclusively for official use; that Department buying these stamps at wholesale could secure them for a fraction of what we now pay for them from our company funds.

Some of the inks made for rubber stamps are more permanent than others and if the Quartermaster's Department supplied the ink, companies would secure that least liable to fade.

A NATIONAL CORRESPONDENCE SCHOOL FOR THE NATIONAL GUARD.

By Captain JOHN McAULEY PALMER, 15th U. S. Infantry.

FFICERS of the National Guard and their friends throughout the country will probably agree that the most important problem confronting the force to-day is the problem of education. There may be a considerable difference of opinion as to organization, and especially as to the relations that should exist between the State Troops and the National Government, but all students of the subject will agree that no matter what organization is adopted, the basis of any real improvement must be sought in better training, better education.

The question as to whether or not the National Guard can be made an effective reserve is after all a mere question of education; for if it be well trained it will be an effective reserve, and if not well trained no refinement of organization can save it from failure.

The friends of the National Guard have long recognized the fundamental need of some feasible and uniform system of education, and many propositions have been made with this in view. But they have generally failed because they have called upon the men to do things that cannot be done under usual conditions of service. Some have sought a remedy in longer summer encampments with more or less complicated manœuvres, involving the assembling of large bodies of troops. This suggestion has been impracticable because the men cannot spare the time, and it is essentially unsound under present conditions of service, because extensive manœuvres would probably afford little useful instruction even if time were available.

Manœuvres are instructive in proportion to previous elementary training, and it must be remembered that as a means of military training in Europe, the manœuvre is the culminating exercise of the season's work and is not the elementary

school of the soldier and the company. Manœuvres are ineffective as a means of elementary training because troops cannot manœuvre until after they are trained.

We hear a great deal about the need of more practical instruction when in many instances the force is deficient in the theoretical training that must precede any useful practical work.

The very unequal quality of the National Guard in different parts of the country indicates that present facilities for training have been very unequally utilized. Inspections have disclosed a very marked difference between the best companies and the worst, and in most cases it will probably be found that the difference in quality depends primarily upon the varying capacity of company officers as instructors. In other words, it is probable that even under present conditions, a well trained and energetic captain will make a well trained and efficient company. It is not sufficient for the captain merely to have character and the gift of leadership, he must also be able to teach. He must be the intelligent instructor of each unit of the company and of the company as a unit. If he is able to teach well he will have an efficient company and also a well disciplined company, for successful teaching is the most subtle basis of confidence and therefore of discipline. It will be found in the Regular army as well as in the National Guard that the good company commander is above all things a good instructor. An able captain can develop a good company even in the little one-company armory and with no more field work than can be afforded by the short annual encampment. Such a company will always be prepared for more extended exercises because the captain will understand their meaning and will know how to impart that meaning to his men.

After a considerable acquaintance with the National Guard in several States, it is the opinion of the writer that most National Guard officers approximate as nearly as they can to the ideal above outlined, that they recognize the importance of better military training and that they would loyally avail themselves of any opportunity to make themselves more useful to their men and to the country.

The question of military education is beginning to receive the serious consideration of the War Department, and among

other things it is proposed to give National Guard officers the facilities of the Regular service schools as soon as they are re-established. Such a training will be of great value to the service, but its influence must necessarily be limited by the fact that only a few officers will be able to spare the necessary time from their business interests.

Some way or other a means of education for all ambitious National Guardsmen must be found; a means that will utilize spare hours without demanding an absence from home and business interests. The company officers are properly the elementary instructors of the force and what the Guard needs most is some system that will increase the efficiency of the average line officer as a military instructor.

It seems to me that this need can be met with great economy and simplicity by means of a National Correspondence School of Military Science to be organized and controlled by the War Department as a part of the general scheme of military education. Such a school could guide the studies of National Guard officers in all parts of the country, and could not only prepare them for prescribed government examinations, but would also insure uniformity of training in a most perfect manner.

In making this suggestion I must disclaim any originality as to the method of instruction, because the chief merit of the proposition lies in the fact that the correspondence school has already been thoroughly tested, and is at present furnishing better education to thousands of busy men who would not have the time or the means to profit by any other system of schooling. There are several of these schools in the country that enable artisans to obtain a technical education without interrupting their work for a livelihood. In this way many men have been able to advance themselves from mere hand labor to brain labor, and intelligent employers have so recognized the practical advantages of the system that in some cases they have found it profitable to pay the school expenses of ambitious employés. These practical men have found that it means increased efficiency and that it pays as a business proposition.

Nor is the method confined solely to the improvement of technical work. The University of Chicago offers correspondence courses in psychology, pedagogy, political economy, inter-

national law, history, sociology, languages, mathematics, geology, botany, bacteriology and other subjects, and with sufficient success to credit a certain amount of correspondence work toward a college degree. Indeed I am informed that Queen's College in Canada is able to give its full course for a degree to non-resident students by this method. In other words, the correspondence school has demonstrated its ability to meet the needs of ambitious men who want a better education but cannot afford the time or money to go to college.

After examining the courses of a number of these schools, I am convinced that an elementary course in military science can be taught more easily than most of the studies now conducted with perfect success by the correspondence method.

The general method of instruction is substantially as follows: After being enrolled, the student receives four study papers, each of which is accompanied by an examination sheet on the matter covered by the study paper. The study paper indicates the parts of the adopted text-book to be studied carefully, the parts to be read over, and the parts, if any, to be omitted, also such collateral reading as may be desirable. This careful selection or editing is an advantage to the average student because in many cases the text-book covers a great deal more than is intended for beginners, and the man with limited time must be directed first to the essentials of the subject.

After carefully completing the work laid down in the first study paper, the student prepares the corresponding examination sheet and mails it to the school for correction. In the meantime the instructor considers the first examination sheet and returns it with such corrections and additional tasks or questions as may be necessary, at the same time mailing the fifth study paper to the student. In this way the student always has a sufficient amount of new work on hand while his completed work is being corrected. The advantage of this system is that it encourages orderly and systematic methods of study by means of fixed "lessons." Experience in teaching has shown this division into separate and progressive tasks to be a decided advantage to the average student in every school.

In some subjects the study papers may themselves constitute the text-book. This would be the case where there are no suit-

able text-books, or where the standard text-books are more detailed and exhaustive than may be desirable. For example, suppose the subject to be "Army Regulations"; in this case instead of attempting to give a course in all of the regulations, the school would simply compile a short exposition of those regulations that relate to the duties of the company officer, with some account of the principles of "property accountability," etc. The idea being to prepare the student for the important obligations that he would assume if his company should be suddenly called into the service of the United States.

During the progress of the course the student should be free to ask questions about difficulties that occur to him and in this way the correspondence instructor is enabled to ascertain the needs of particular individuals better than is usually possible in oral classes.

Aside from the prime advantage of giving instruction to ambitious officers and men of the National Guard, the records of such a school would give the Government important data bearing on the officering of volunteers. The work of an individual in the correspondence school would give no inconsiderable measure of his personal equation.

Another thing to be considered is that the correspondence school furnishes the cheapest known method of instruction. Estimates as to cost can only be approximate, but I believe that the Government will be able to give a course of instruction covering the fundamental professional training of a line officer of volunteer infantry at a cost of not more than $25 for each student completing the course. In making this estimate I have in mind a course of study covering from one to two years, depending upon the available time and previous education of the student. After the study sheets are printed one instructor, with proper clerical assistance, will be able to teach several hundred correspondence students. A faculty of ten competent instructors could in this way guide the studies of all the company officers in the National Guard.

It is not expected that such a course would give a mastery of the art of war, but it would certainly be sufficient to ground the student in the essential duties of the line officer both in tactics and in company administration.

If, after a satisfactory examination, the Government should give a certificate or diploma recognizing the work done, I am satisfied that most officers of the National Guard would endeavor to secure it and that those who did not seek it would sooner or later be crowded out by more ambitious men. After such a course an officer would be better equipped to teach his company and to prepare it for more advanced practical work or for the field. Indeed I believe that if the opportunity were given, many of the enlisted men of the Guard would embrace it with the effect that in most companies we would have private soldiers who, in the event of war, would be qualified to organize other companies. Such a condition would be most favorable for orderly expansion and would seem to realize that ideal standard of "a well regulated militia" which our fathers praised so eloquently but never attained.

In order to give a more definite idea of the proposed system the outline of a course is presented below. It is not intended to offer this as an ideal curriculum, but simply to facilitate discussion of the general scheme. The essential question is whether any correspondence course would be accepted by the officers of the National Guard as feasible and adapted to their needs.

AN ELEMENTARY COURSE IN MILITARY SCIENCE.

(Adapted to the needs of company officers, and leading to a certificate of eligibility for appointment as a line officer of Volunteer Infantry.)

I.

MILITARY CORRESPONDENCE.

Study of the regulations governing official correspondence—Records of correspondence.

Practical Work.—All communications between student and instructor to be in accordance with regulations. Papers returned for correction to be properly briefed and endorsed.

II.

DRILL AND MINOR TACTICS.

Drill Regulations, to include the school of the company of infantry in close and extended order, Relations of drill to tactics and to disipline, —Duties of officers and non-commissioned officers as instructors,—Squad leading,—Principles of fire discipline,—The company in battalion, etc.

Guard duty.—The essential principles of interior guard duty,—Duties of sentinels, non-commissioned officers and officers,—Relation of guard duty to discipline.

Topography,—Elementary topography,—How to read a map,—How to make a simple military sketch,—Conventional signs,—Route sketching and reports of marches, etc.,—Practical problems illustrating the use of maps.

Minor Tactics,—Simple principles,—The service of security and information,—Advance guards and outposts,—Patrols and scouts,—Conventional signals,—The drill of the company in advance guard duty,—Hasty entrenchments,—Simple field engineering,—Relations of ground to minor tactics,—Simple problems involving the use of maps.

Marching and Camping.—The art of marching with a minimum of fatigue,—Rests,—Timed marches.—Equipment and clothing for the march,—Hygiene of the march,—Marching with limited transportation,—Bivouacs and camps,—Extemporized comforts and conveniences,—The company en route by rail and at sea.—Regulations for the comfort, health and safety of the men.

III.

ADMINISTRATION AND REGULATIONS.

Army Regulations.—The Articles of War and Army Regulations in so far as they relate to the rights and duties of enlisted men and officers of the line,—Military justice,—Preparation of charges,—Punishments,—Customs of the service,—Military courtesies and compliments.

Company Administration.—The duties of the company commander,—Discipline and instruction of enlisted men,—Duties of non-commissioned officers,—Company property,—The proper equipment of the company,—How the company is supplied,—Administration of company funds,—The company kitchen and mess,—Inspection and police of camps and quarters,—Company papers and records with practical exercises in their preparation.

Property Accountability.—How property is issued, transferred, expended and accounted for,—Practical exercises in the preparation of simple property returns,—The physical care of property,—Issues to enlisted men,—Boards of survey, etc.

Military Hygiene.—The health of the company,—Camp diseases and their prevention,—Water,—The hygiene of cooking,—First aid to the sick and wounded,—Sanitary inspection of camps and quarters,—General rules for the preservation of health,—Responsibility of company commanders for the health and comfort of their men.

The course, as outlined above, applies approximately to the needs of the officer of infantry. Similar courses could be prepared to meet the needs of the officers of other arms.

A thorough treatment of all the subjects referred to in the curriculum would take a great deal of time, and would of course be out of the question, but it is believed that what is most urgently required by the average line officer could be imparted in this way, and that the work could be made interesting as well as profitable.

Supervision of the course.—The general supervision of the course should be exercised by some suitable bureau of the War Department, or as a means of military education it might come under the general purview of the War College. In any event it would seem to be a most excellent means of distributing and popularizing military knowledge, and it should open up new and useful relations between officers of the army and officers in the National Guard.

The original enrollment of National Guard students in the correspondence school should be with the approval or upon the application of the governors of their respective States, and records of the progress and graduation of students should be furnished to the States in which they perform militia duty.

If the work should not be undertaken by the general government, schools could be organized by each State, but it would be in the interest of economy, efficiency and uniformity for the service of the school to be offered by the War Department to all of the States. Such a system would be in no way inconsistent with the plan of militia reorganization recently proposed by the Secretary of War.

Time permitted for the course.—One of the advantages of the correspondence system is that the student's rate of progress depends entirely upon his own qualifications and available time. There should be some maximum time limit, liberal enough to encourage men with little spare time or little preliminary education. Students whose private reading had already covered parts of the course would naturally qualify sooner than others.

Examinations.—The student should be advanced from subject to subject after examinations conducted by correspondence, but the final examinations leading to a certificate or diploma should be held at stated times and places, substantially as civil service examinations are now conducted.

Advanced Work.—The above course is intended as an elementary course leading to a certificate of efficiency. More advanced courses in military science could be offered to those who had finished the first course or to other properly qualified persons. In this way the duties of the several staff corps could be taught to staff officers of the National Guard. Line and field officers could also obtain advanced instruction in topography, minor tactics, administration, military law, logistics, etc. The number and extent of courses offered to advanced students need be limited only by their interest and ambition. The school would thus enable the Government to differentiate and to develop the latent talent of the National Guard. Distinguished graduates of correspondence school would be peculiarly qualified for resident study at the Regular army service schools.

Relation of the correspondence school to practical field work.—A uniform system of theoretical instruction would be the best means of securing intelligent and uniform field instruction. Much of the present work of

the summer encampment is purely elementary. With better instruction at the home station, more useful work could be done in camp even if it should continue to be impracticable to extend the time available for the summer encampment. The value of the practical work of the company depends primarily upon the theoretical instruction of the company commander.

It might be urged against this system of instruction that it would encroach too much upon the independent jurisdiction of the several States. But the service of the school would be purely voluntary. It would simply appeal to the pride of individual officers and would offer as an incentive, national recognition of professional efficiency. It might also be urged that National Guard officers should get their education at their own expense, but the party most interested in a uniform militia is the national government, and the cheapest and most practical means of securing general uniformity will be through a uniform system of education.

It must be admitted that in many ways the National Guard is far from being an effective reserve to-day, but we should remember that it has received but little encouragement either from state or national government. If in some respects it diverts its energies into unprofitable channels, we must remember that the nation has never fulfilled the constitutional obligation to train it right. If many of its officers are poorly qualified, we must remember that no standard of efficiency has ever been pointed out to them or prescribed.

It cannot be justly said that the National Guard system has ever failed, because it has never been tested under fair conditions.

One thing we certainly know about it, and that is that it consists of more than 115,000 representative young Americans who serve from choice and without hire, and ask nothing but an opportunity to become good soldiers. Would any other military power ignore such a gratuitous offer of loyal military service?

MILITARY OCCUPATION OF NORTHERN LUZON.

By Captain W. L. SIBERT, Corps of Engineers, U. S. A.
(Late Chief Engineer Eighth Army Corps.)

ONVICTION came to all at the beginning of the summer of 1899 that the military problem in the Philippines was an unusual one. General MacArthur's division, operating north from Manila along the Manila and Dagupan railroad, had dealt the insurgent forces blow after blow, and should have proved to the Filipino his utter inability to withstand the American arms.

General Lawton's impressive campaigns from Manila north to San Isidro, from Manila south to Imus, and from Manila to and along the shores of the Laguna de Bay, should have taught a similar lesson both to the armed insurgents encountered and to a large portion of the population most intimately connected with the insurrection.

The ordinary means of quelling insurrections, viz., by continually defeating the armed insurgent force, and by impressing upon the people generally the power and irresistibility of the Government, having failed, a complete military occupation of the islands, involving the garrisoning of all important towns and the controlling of all arteries of trade on land and sea, was decided upon. Such an occupation requires a larger armed force than that necessary to defeat the enemy's army in campaign, and the Government, appreciating this, organized the extra troops needed and transported them to Manila in the summer and autumn of 1899.

There was very little aggressive work done by the American forces during the summer of 1899. The Spanish War volunteers were shipped back to the United States, and operations were largely confined to holding the territory already in the possession of the American army. It had been shown conclusively that campaigns through the insurgent territory were practically a useless expenditure of life and material, unless there were

troops sufficient to properly garrison and hold all the towns in the conquered territory. Expeditions passing through sections of the country that had been campaigned over before, and not garrisoned, encountered as much opposition as the previous expeditions.

Appreciating this fact, and notwithstanding the clamor of certain newspapers and certain people who were either ignorant of, or did not want to understand, the true military situation, General Otis, the Commander of the 8th Army Corps, and Military Governor of the Philippine Islands, stopped practically all military expeditions and bided his time, until the necessary force and transportation should reach the Philippines, for the full accomplishment of the task of taking and completely occupying all the Islands.

The object of this article is to give an outlined description of the plan and execution of this task in Northern Luzon.

The first step taken by General Otis in the prosecution of this undertaking was to take possession of and hold the Great Central Valley of Luzon, extending from Manila to Dagupan, 125 miles long, and from 30 to 40 miles wide, the granary of the island. The characteristics of the enemy were well known by this time. His lack of initiative, his lack of ability to appreciate the meaning of military movements or to seize any advantage presented in the field of operations, were taken advantage of by General Otis in planning the campaign for the accomplishment of the above stated object.

The American forces north of Manila, prior to the beginning of this campaign, held the line of the railroad from Manila to Angeles; the Quingua River from the railroad east to Baliuag; the Rio Grande de la Pampanga from the railroad northeast to Candaba, and the Rio de San Fernando from Guagua to Mexico.

The headquarters of the insurgent army and their seat of government were at Tarlac. The main body of the insurgent force in Northern Luzon was confronting the advance of General MacArthur's division at Angeles, and observing the line from there northeast to Magalang, with detached forces observing the American garrisons at Quingua, Baliuag and Candaba. Mascardo's command was actively annoying the American scouting

parties and raiding the country westward of Guagua and Santa Rita.

The plan adopted was: General MacArthur's division to seize Magalang and hold the line, Magalang, Angeles, Porac, Guagua.

General Lawton's division, which contained practically all the cavalry on the island, to concentrate and establish a secondary base of supplies at San Isidro, and from that base to advance quickly north with his cavalry, supported by the other arms of the service, and seize and hold all the roads and trails leading east and north between San Isidro and San Nicolas, via Cabanatuan. The part assigned this division included all military movements necessary to protect the flank of the column, such as taking and holding Aliaga, etc.

General Wheaton's brigade, as an independent command, to take ship at Manila and disembark at or near San Fabian, and seize and hold all trails leading north between San Fabian and San Nicolas.

General MacArthur's division, after detaching General Grant's brigade to observe and deal with Mascardo's force operating from the eastern base of the Zambales mountains, to advance north along the line of the Manila and Dagupan railroad, when General Lawton's and General Wheaton's commands had reached such positions as to insure the accomplishment of their part of the plan.

The execution of this plan was to commence about November 1st, as soon as sufficient troops would be available.

It was confidently felt that the insurgent army had neither the means nor the initiative to concentrate and attack either Lawton's or Wheaton's commands, with any hope of success, notwithstanding the fact that the march of both of these commands was in the nature of a flank movement in close proximity to the enemy, and that an engagement brought on with either command could force that command to accept battle with its front parallel to its line of communications.

The successful general violates any or all military precepts, to gain results, when he feels that his enemy has not the ability to take advantage of such violations.

The plan of campaign was therefore a plan for partially sur-

rounding the enemy, cutting off his retreat into the mountains to the east and north, capturing him if possible, and at the same time taking possession of the heart of his country.

General Lawton commenced his march from San Isidro to Cabanatuan October 26th. General Wheaton landed at San Fabian, November 7th.

General MacArthur, after taking Magalang, November 5th, commenced his advance north along the railway November 8th. On November 19th, in a little more than three weeks' time, the objects of the campaign were accomplished. An organized insurgent force in northern Luzon ceased to exist; the records of the insurgent government were captured, and Aguinaldo, with a small guard, was a fugitive in the mountains of northern Luzon, with American troops in pursuit, and American troops were taking possession of the great Caygayan Valley without opposition, and soon penetrated all of the inhabited portions of the northern end of that island.

This was all accomplished with very little loss of life and very few engagements. General Wheaton's commaud encountered and defeated at San Jacinto probably the largest insurgent force. The large force in front of MacArthur's command began to dissipate when Lawton's and Wheaton's movements commenced, and the advance north along the railroad from Angeles to Dagupan met a slight resistance only at one place, Bamban. General Lawton's force had to contend only with local militia in each town or, at least, with small Insurgent organizations.

The combined movements, executed with such celerity, thoroughly overawed and disconcerted the insurgents and caused them, almost without fighting, to give up all organization, to scatter and to hide their arms. A great many of them never took the field again; however, many small bands continued predatory operations.

The above campaign was managed so as to accomplish its object with very little fighting, and it was a striking example of the characteristic trait of the American, to go where he starts to go. Instead of November being the first month of the dry season, it rained almost continually for the first sixteen days. All streams became raging torrents, bridges and ferries were continually washed away. It was impossible to transport sup-

plies on Lawton's line of communications, and his advanced troops, under General Young, cut loose from their wagons and lived on the country until the designated roads and trails were covered.

The determination to overcome all difficulties, so characteristic of General Lawton, was most thoroughly tested in this campaign, with the result that he fulfilled his full part.

The progress of General MacArthur's command, in its march from Angeles to Dagupan, was largely governed by its ability to overcome serious road difficulties between Bamban and Tarlac, and by its ingenuity in supplying itself over a thoroughly wrecked and dismantled railroad.

While one would seldom study a campaign between an army belonging to an up-to-date nation such as the United States, and an army that knew very little of the art and science of war, with the hope of finding any new illustrations of the principles of war, still, nearly all examples of warfare contain something valuable to the military student. A study of the details of this campaign, as executed, will show that it deserves special consideration on account of the short time in which its objects were thoroughly accomplished, in spite of the fact that the physical difficulties were as great as those ever encountered by troops in the field. One in search of examples of how an army can improvise transportation and supply itself, while campaigning in a country often without roads and traversed by many bridgeless streams, could study with benefit the details of the American operations in the Philippines.

General Otis, by disorganizing all armed resistance and occupying the enemy's country, performed the same part in the Philippines that General Roberts performed in South Africa. To General Otis' successors was left the difficult task of accomplishing what General Kitchener is trying to accomplish in South Africa, viz.: The suppression of hostile bands operating in a country thoroughly in sympathy with them.

THE SQUAD FORMATION: ITS ADVANTAGES AS ILLUSTRATED BY AN INFANTRY COMPANY IN THE PHILIPPINES.

By Captain P. E. PIERCE, U. S. A., Thirteenth Infantry.

A NOTED English military authority, in a recent article on the English-Boer war, expressed approval of the manner in which the English officer has adapted himself to the novel conditions of that conflict. The necessity for the proper training and disciplining of the smaller tactical units is brought out in the following striking paragraph:—

"One lesson there is, however, which should be laid closely to heart as a valuable legacy of the Boer war. It has been made most abundantly plain that in future warfare the largest results may be dependent upon the action of the smallest bodies. The subordinate agent, the subaltern, the sergeant even, with a handful of men may more effectually govern the issues of the fight than the general commanding. What we most urgently need now is that these minor agents should be properly prepared for the responsibilities that will certainly be thrown upon them. Their training in this respect, it may be confessed, has been generally defective and insufficient. There has ever been an extreme reluctance on the part of superiors to surrender control of items and units under their command. This may be due to fussiness or distrust, or, and more largely perhaps, to traditional system. A colonel is loath to surrender even a tittle of his authority; he wants to do everything himself; is not his the chief, the ultimate responsibility? He is answerable and may be called to account for the results achieved. But where the efforts made are, as nowadays, distributed over such a wide area *they must be intrusted to much smaller people, and it is on education and due preparation of these for the trials and difficulties ahead that the success must eventually depend.*

The need for such training in our own army is certainly as great as in any other. The fact that in time of war many officers always have been, and in all probability always will be, placed on duty with the volunteers makes the training of the squads and their leaders of prime importance. In the Philippine war, while the last volunteers were in the service, it was the exception rather than the rule, to have more than one officer present for duty with each Regular company of infantry. For instance, when the 13th Infantry took the field under Brig-

adier General Loyd Wheaton, November, 1899, out of a total of 46 officers only 26 were present for duty with the colors. A company commander without subalterns to assist him to gain and keep up the efficiency of his command, should have good non-commissioned officers, and the men so disciplined that they will follow and obey their leaders under all circumstances.

The object of this paper is to show the value of the squad formation in promoting the efficiency of non-commissioned officers and privates, as illustrated by the varied experience of Company K, 13th Infantry, in the Island of Luzon, P. I., from June to December, 1899.

* * *

Paragraph 267, Army Regulations, directs that the enlisted men of an infantry company be divided into squads, each under the charge of a non-commissioned officer. Paragraphs 270 and 271 state that the chiefs of these squads shall be held responsible for the cleanliness of the men and of the quarters occupied by them. Paragraph 179 of the Infantry Drill Regulations, further provides that the company be grouped into squads under the leadership and immediate control of the non-commissioned officers, who shall be held responsible for their discipline and orderly behavior in camp and quarters, and who shall be trained as leaders of groups for battle.

The above regulations were supplemented by a long order issued to his troops in 1899 by Major-General Henry W. Lawton, U. S. V., Commanding the 1st Division, 8th Army Corps, Philippine Islands. This order laid special stress upon the proper formation of the companies into squads, and the thorough drill of the members of these squads, so that in time of battle they should feel and act as true comrades.

Company K was furnished with a copy of General Lawton's order soon after its arrival in Manila, May 29th, 1899, the 13th Infantry having been assigned to his command.

In its constitution this company was no doubt typical of those new organizations so hastily formed in the fall of 1898. Upon arrival in the Philippines in the following May, it had an enlisted strength of 110. Of these soldiers only eight had had previous service. Seven of these eight were non-commissioned officers. Eleven of the non-commissioned officers were in their

first enlistment. There was but one old soldier among the 92 privates.

Before arrival in the Philippines the company had been carefully divided into platoons, sections and squads as required by orders and regulations. However, there had been but little time and opportunity for drill and discipline. This lack of discipline and of the idea that the squad is the unit from which the soldier should never separate, except under orders or direst necessity, was painfully apparent during the first expedition of which the company formed a part, June 9th, 10th and 11th, 1899. The 13th Infantry had been on shore nine days when it was ordered from its temporary camp on the Luneta to join General Lawton's expedition against the insurgents to the south of Manila. Two days field rations, 150 rounds of ammunition and a blanket roll made up of a shelter half, poncho, change of under clothing, towel and soap, were carried by each man. The khaki blouse was worn over the blue flannel shirt. The company had a most trying day June 10th; this was largely due to the fact that it had but recently landed from its long voyage across the Pacific and was unaccustomed to conditions prevalent in the Philippine Islands. The men were also too heavily laden and after this first experience they never carried such heavy burdens nor wore so much clothing while in the field. However, the inactivity of life aboard ship and lack of experience were not entirely responsible for the poor work done on this day, as will be shown.

The extreme heat of June 10th was unrelieved by a single cloud. The rolling land on the scene of action, Guadalupe Ridge, which lies between the Laguna and Manila Bay to the south of the city, was almost destitute of shade trees and of water. At 7.30 A. M., June 10th, Company K as a part of the fighting line, was under fire for the first time. The insurgents, few in number, were entrenched in the immediate front. Upon arriving within some 350 yards of the enemy, the Company Commander endeavored to advance the company by rushes. He found it extremely difficult to get the men to move forward together on the double time or to halt at the command. They were too excited, too new to the business to even hear the orders given. The squad leaders were called on to assist in control-

ing the men, but most of these were as excited and incapable of prompt obedience as the privates themselves. The company was eager to move forward and get at the enemy, but it was not so disciplined that it would obey the orders of its Commanding Officer promptly in the excitement of the fight. During his efforts to keep the attention and control of the men, the Company Commander, who had no lieutenants to assist him, overheard the following colloquy between two of his privates just after an enemy's bullet had passed through the grass near them: "Bill, did you see that! Gee, it was a close un; went right between us!" To which Bill replied: "No, it didn't, it went just by my right ear, I felt the wind from it!" The discussion over this matter was waxing warm when suddenly interrupted by the Company Commander, who even had to lay hands on the men to get their attention. Advancing over rough ground and through high grass, the men, unaccustomed to the tropic heat, soon became tired and began to discard blouses, rolls, and even haversacks in spite of all efforts made to prevent it. They seemed imbued with the idea that they would soon return over this same ground and could pick up the discarded articles. About 40 per cent. of the men were thus foolish enough to throw away all of their rations, which were contained in the haversacks they left behind them.

At 9.30 in the morning all opposition from the immediate front had been brushed aside and the company, as part of a long column, started southward over the high land between Laguna de Bay and Manila Bay. Orders had been issued that if any man was so overcome by heat that he had to fall out, two men should be left with him. Soon the intense heat and the lack of drinking water began to affect the weaker men and, at one time, only 30 men were in ranks out of the 92 effective with which the day's operations began. Squads were disorganized and what squad leaders were present were not always able to report the whereabouts of their men, although the strictest orders had been given on the subject. The company went into bivouac that night at 6.30 and by taps all the men had rejoined the company, except two who were too sick to do so.

As a result of this trying day's work, the Company Commander was confirmed in his opinion that the company needed

severe disciplining—especially that the squad leaders needed to be trained so that they should become real leaders on the march and in the fight, and that the privates should become true followers—recognizing the authority of their leaders under all circumstances, and clinging at all times to the squad as a unit from which they must not separate.

On June 24th Company K took station at Pasay, about two miles to the south of Manila, where it remained until October, as part of the line guarding the trenches which stretched from the Bay to the Pasig River. It was the beginning of the rainy season which proved to be an exceptionally severe one. During July about four feet of water fell, and during August and September there was, to say the least, no lack of rain. In spite of the unfavorable weather conditions, every possible effort was made to develop and strengthen the squad system. The following method was pursued :

1st. The non-commissioned officers were thoroughly instructed in their duties as leaders; attention was repeatedly called to their failure as such during the field operations in the preceding June.

2d. The squads were scattered along the trenches and lived in shacks immediately in their rear. The squad leaders were held strictly responsible for the police of their respective quarters and the grounds surrounding them. The chiefs of sections were held responsible for the proper performance of duty by their chiefs of squads.

3d. Under the supervision of the chiefs of sections and the Company Commander, the squad leaders were required to inspect the arms and equipments of their men at retreat and Saturday Inspection.

4th. Roll-call was by squad. At the command for the roll-call each squad leader stepped one pace to the front, faced about, verified his men, faced about again and, at the command, made his report to the 1st Sergeant and stepped back into ranks. If any men were absent the squad leader was required to be able to state where they were and what duty they were on.

5th. Exercises in manning the trenches were frequent. At a given signal all the men were required to arm themselves and

run to their assigned places in the trenches. The squad leaders then reported to the chiefs of section, the latter to the 1st Sergeant and the 1st Sergeant to the Company Commander.

6th. The company was given as many extended order drills and practice marches as possible. During the practice marches the non-commissioned officers were required to keep their men under control at all times. Straggling, falling out or the loss of any part of the equipment, always brought swift and severe punishment, both on the offender himself and the non-commissioned officer who permitted it.

7th. Squads were frequently sent out on reconnaissance. On return of a squad, the leader was required to submit a written report accompanied by a road sketch.

8th. The privates were instructed in their duties as members of the squads and in the obedience they owed to their leaders. The seriousness of the offenses of straggling and of throwing away any part of the equipment was repeatedly emphasized.

The Adjutant of the regiment believed thoroughly in the efficacy of the squad system and did all he could to encourage it. As far as practicable, all details of enlisted men from regimental headquarters were made by squads. If a man's equipment was dirty at guard mount the Adjutant always held the squad leader equally responsible with the man himself, as is required by paragraph 271 A. R.

The result of this training was quite apparent when the company took the field again, October 5th, 1899, as a part of Brigadier-General Theodore Schwan's punitive expedition through Cavité Province. On October 9th, the company was the advance guard for the column which marched that day from Novaleta to a Spanish hacienda about two miles beyond the town of Rosario on the road to San Francisco de Malabon. The insurgents resisted the advance all the way, firing at the troops from the numerous trenches that obstructed the road and from the trees and undergrowth that lined it. The mud in places was almost bottomless. The flanking squads had to move through water from ankle to waist deep and at times to ford streams neck deep. They were out of sight of the Company Commander most of the distance. It was a trying march and one inducive of squad disorganization, and yet during the

day only one man got separated from his squad. None of the equipment was lost or thrown away. The result of the day's work showed the great advance the company had made since the previous June. The orders of its commander were heard and obeyed. Company K, 13th Infantry, had become a fighting machine—manageable and powerful.

On the following day the company entered San Francisco de Malabon as a part of the main body.

General Schwan, having decided to make a reconnaissance to the south with one battalion, Company K found itself in the lead again. The advance guard formation was taken up, as on the previous day's march, with the point well advanced. Just on the outskirts of the town a vigorous fire from the enemy suddenly swept over the advance party. It continued for only a few moments. The road was bordered on each side by heavy vegetation which limited the range of vision to a few yards. Calling up three squads under their chief of section, the Company Commander directed him to push across a small stream which ran through a deep ravine just to the left of the road, and to move upon the enemy when the rest of the company became engaged. Moving forward, the engagement soon recommenced. The insurgents were found entrenched on the side of the stream to which the sergeant and his three squads had gone. In a brief but spirited action they were driven away and severely punished. An insurgent hospital and a storehouse well filled with munitions of war were captured by the company. The entire company took part in a charge over open ground toward the earthworks of the enemy about 300 yards distant, in the face of a heavy but poorly directed fire. As the company was reforming for a further advance along the road to the south, the sergeant who had led the three squads across the river and done such gallant work, reported his return with the squads complete.

* * *

Other incidents in this day's work might be given to illustrate the great value of the squad system in making a company hang together, but suffice it to say that Company K returned to San Francisco de Malabon with fifty-two prisoners, of whom two were insurgent officers. It had destroyed many stores and

inflicted much loss upon the enemy—21 wounded and 7 dead Filipinos were found in the insurgent hospital after the fight. Most encouraging of all, however, was the fact that, during the day, the squads had acted like units and the men like true comrades.

On November 5th, 1899, Company K embarked, with the rest of the 13th Infantry, on the transport *Sheridan* en route to the Lingayen Gulf, as a part of the expeditionary brigade of Brigadier-General Loyd Wheaton. San Fabian had been selected as the landing place. About 4 P. M., November 7th, the transport approached the coast and prepared to land the troops. Company K had been designated to be the first company to land and as the right of the fighting line on shore. The company was formed into eleven full squads and stationed, fully equipped, near the gangway. As the small boats came alongside two squads were ordered into each. The Company-Commander went with the first boat-load; the first sergeant supervised the loading and himself went with the last squad of the company. No confusion or delay of any kind occurred. The small boats in strings of five were soon being towed by launches towards the beach. The landing parties were protected by the vigorous fire of six U. S. Navy gunboats. So effective was this protection that only a few scattering shots fell about the small boats and but two men were wounded during the landing. The unity of action of the respective squads of Company K on reaching the shore was very noticeable. They came on the run to their designated places in line without confusion and with every man present. The insurgent fire was quite brisk, and this made the difference in the behavior of the men on this occasion and that of the previous June all the more remarkable. As soon as the fighting line was formed, volley firing was ordered, and finally a charge into the trees and undergrowth in the immediate front. The men in all the excitement (and nothing could have been more exciting than this whole operation) were amenable to orders. The non-commissioned officers were real assistants to the Company Commander, and at all times helped to keep the men under perfect control.

After advancing about a mile and a half the company formed outposts, but just after nightfall it was ordered to return to the

centre of the town to bivouac. On arrival there an inspection was made and only one man was absent from his squad without authority; one private had lost his cartridge belt in the sea, and this was the only property lost.

No better test of the value of the squad system could have been devised than this day's work, which included the landing under fire of the company from a transport; the formation of the fighting line in the immediate presence of the enemy after plunging through a surf stirred up by the swell rolling into the Gulf from the China Sea; a charge across rough country; and, finally, the withdrawal after dark of the company and the night march to its bivouac in town. The celerity with which these various movements were executed and the lack of confusion impressed itself upon all who beheld it.

Many other incidents might be cited in illustration of the value of the squad system to Company K, 13th Infantry, but enough have been given to bring out the great advance the company had made in efficiency within four months. It had become a coöperative organization instead of a mere mob of individuals.

Translations and Reprints.

THE AMERICAN CAVALRY IN THE WAR OF SECESSION.*

(Translated from Revue de Cavalerie, by Capt. J. A. Shipton, U. S. A.)

AMONG modern wars, that of the United States called the War of the Secession holds a quite unique place, since it resembles no other war. European nations all have their war-like traditions, and from their birth down to modern times, they have had frequent struggles to sustain, which has obliged them to keep up continually a considerable armed force, even before the creation of permanent armies. From these has resulted military traditions, which fact has had its advantages and disadvantages. The advantages have been tactical experience, the nucleus of trained troops that they have always supported, a continuous and complete administrative organization. The disadvantages have been routine, which prevented armies from adapting themselves to new tactical requirements resulting from new conditions of life, progress and improvements in armaments, notably the invention of gunpowder; the permanent conservation with the colors of large numbers of men, who were thus distracted from more useful occupations, and whose rude life could not be other than a lowering of moral standard, especially in the times when the army was composed entirely of professional soldiers.

After the War of Independence, that is to say for almost a century, when the War of the Secession broke out, the United States had not had what we call a serious war, if we except the Mexican War, in which, however, the effective strength of the army never exceeded about 14,000 or 15,000 men. They had no unquiet neighbors; and so, they not only did not feel the necessity of a standing army, but the military profession was rather a discredit. Thus when the war broke out between the North and the South, they had no armies, no generals, no general staff, no cannon, no guns, no war-treasure nor administration. Everything had to be created. It was necessary that the military organization, command, armaments, etc., should in some way spring up out of the earth all in one piece, and that in the presence of the most modern perfection, in a country in a complete state of civilization. One might say, then, that the Americans invented modern tactics; this war has not

*It is always interesting and sometimes instructive to "see ourselves as others see us." These extracts from a recent publication in a leading French service magazine are valuable as cavalry studies of American operations from the European point of view. [Ed. J. M. S. I.]

been sufficiently studied, we turned up our noses too much, in the beginning at this army of merchants and workmen, without reflecting that during the war, five years, there was a long enough experience to create and make veterans, of armies, which came to be so much better, so much more solid, because the two parties were so embittered. This is the first war in which such large armies faced each other, the North alone mobilizing at one time 1,100,000 men. It was much to be desired that we should have profited by the lessons of that war, the study of which would most certainly have avoided the disasters of 1870; but it was unfortunately too little known. There was at the beginning much groping, feeling the way; the Americans—an initiative people, innovators in everything—could not follow the beaten paths; little by little they became the pioneers in modern military science, they were the first to set the example of generally using lines of skirmishers, of fortifications on the field of battle, of cavalry reconnaissances at long distances. They also inaugurated rapid-fire arms. And if one reads the campaigns of 1866 in Austria, of 1870 in France, one is struck by seeing how much the armies of the great Powers which took part in these struggles were behind in all these particulars from an American army point of view; we have not wished to see clearly, we have not profited by the experience gained and progress made on the other side of the ocean.

* * *

The cavalry dates only from 1832, the year in which the 1st Regiment of Dragoons was formed; the 2d dates from 1836, the 3d from 1846, as well as the Mounted Riflemen, who went through the campaign in Mexico on foot in spite of their name of "Chasseurs à Cheval." In 1855 two Regiments of Cavalry were formed and these were increased to six in 1861. All the six took the simple name of Regiments of Cavalry.

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The American cavalry had many characteristics peculiarly its own; it reached a very large figure, since in 1863, there were 223 regiments of cavalry in the North. At the beginning of the war the Confederate cavalry, in which each soldier was mounted at his own expense, formed an aristocratic corps and had marked advantage over the Federal cavalry. Later on, the first body of Confederate troops being exhausted, and their cavalry being recruited with great difficulty, it deteriorated; while that of the Federals made great progress and had an incontestable superiority over that of its adversary. There were but few engagements of cavalry, as elsewhere in most wars, it being much used to fight on foot against infantry. The cavalry soldier was generally armed with a sabre, a revolver and a breech loading carbine. Nothing was absolutely uniform. In some regiments the men had two, or even three revolvers and sometimes no sabre. The model of carbine varied greatly; those most employed were the Spencer and Burnside, and especially the

Springfield, of which a great number were manufactured in 1862 and 1863.

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The revolver was carried in the belt; the cloak was rolled up on the front of the saddle and the portmanteau, square and voluminous, was swung from the saddle behind the rider, and a wallet was hung from the right side. Sometimes eight to twelve days rations were carried. The cavalryman carried on his horse a shelter half, a woolen blanket and a rain coat. The saddle, called the McClellan, was excellent. The tree was made of wood, as well as the stirrups, which were covered with a sort of leather shoe and had besides a leg guard, a piece of leather running along the stirrup strap to protect the leg of the rider. This stirrup was a protection against hot and cold weather, but was large and unwieldy. After Sheridan's raid in Virginia, an expedition which lasted more than one month, of six thousand horses put out of service or worn out, there was not a single one wounded over the kidneys or withers.

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The rider sat his saddle like a fork, the leg extended, the end of the foot resting on the stirrup; this position, which appeared fatiguing, seemed due to the form of the saddle tree. Generally the rider carried his hand low and the horse was completely abandoned on the forehand. French theories were followed in the details of instruction. The American horse is very hardy, very intelligent and stands a lot of work. The gallop is the ordinary fast gait; marches being generally made at a walk. A great number of horses were used up during the war. General Chanal points out that the Army of the Potomac, for an effective strength of ten thousand to fourteen thousand men, was furnished from May to October, that is to say for six months, with more than thirty-five thousand horses. Rigorous measures were adopted to prevent this enormous consumption of horses, which arose from over work, from want of care, and from inexperience in handling. In spite of these measures the consumption of horses during the war was more than three hundred thousand. Officers were mounted at their own expense; they had no orderlies and were followed by servants who carried their provisions. The American soldier is indefatigable on the march, and resigned to hardships; he attacks resolutely, but coldly. Once engaged he is tenacious to the point of obstinacy, and it is the most difficult thing in the world to withdraw him from the fight, even in spite of heavy losses. At bottom, and in all that is essential, discipline was well observed and the troops were submissive to their leaders. It is very evident that the American troops had not had the time to become well drilled; they became on the contrary very skillful in covering themselves by field fortifications, the cavalry as well as the other arms.

The American army was not entirely without experience, and in spite of the limited effective strength which was used in the war against Mexico in 1847, it showed in that war a tenacity and skill worthy of all

praise. It was a veteran army, even, since in all the fights in which the Mexican offered a too serious resistance in front, the Americans endeavored to turn their flank. It was in this campaign, too little known, that were formed the generals whom we see at the head of the two opposing armies, in the War of the Secession: Lee, McClellan, Beauregard, Sumner and Kearney.

Besides the Regular troops, the volunteers and militia, the Confederates had numerous corps of partisans, or guerrillas. They were like our Francs-tireurs, some good, courageous and devoted; others, a veritable gang of bandits who, in war, sought only for pillage, and ran away or retired as soon as they found themselves in front of a serious resistance. We shall have occasion to speak of them again in the course of this article, when we shall give a more detailed description.

The manners and education of the Confederate soldiers gave, at the beginning, a great superiority to their cavalry over that of the North. Recruited among the inhabitants of the country, who before the war, already owned a horse and who, on enlisting, brought the horse along with them, they knew better how to use him; since, the roads being unsuited to carriages, this was almost the only means of transportation. They were also fighting on their own ground, and had with them the sympathy and assistance of the inhabitants, who served them as spies and found them all the forage and assistance necessary.

In the North the first volunteers were composed of undisciplined men and idle workmen engaged for a short time, who did not serve for patriotism, and who on the day their enlistment ended left the flag. It was not the same later on, when it began to be understood that the nation was in danger and when everybody resolved to conquer. All men came up to be enrolled; men of all classes, of all conditions, and the enlistments were for three years and were made with the firm intention of becoming soldiers, and of opposing the most tenacious resistance to the projects of the Confederates.

The volunteer cavalry imitated the ancient dragoons in their manner of fighting. Their want of experience in riding made them prefer the carbine to the sabre or bayonet, the fight at long range to the hand-to-hand encounter. They were the forerunners of the mounted infantry used by the English in South Africa. When the moment arrived to engage the enemy they dismounted, and a fourth of the men held the horses while the rest advanced to open fire. Their adventurous spirit made them very skillful as outposts and scouts.

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The Confederates (Bull Run) attempted to pursue the routed Federals and took some prisoners and booty, but were checked by some regiments of infantry which had escaped defeat by the Regular cavalry of its adversaries.

There was a division of opinion in regard to cavalry, the politicians not understanding its usefulness in a country so covered and wooded as

the theatre of war. The military insisted, and made it understood, by just reasons, that it was very necessary that an army should be well informed and guarded at a long distance. They demanded the organization of one regiment of cavalry to each division of infantry, and in addition a reserve. The armament and equipment of the cavalry left much to be desired in the beginning of the war. Besides the sabre and the revolver, there were only two squadrons to each regiment to which carbines could be furnished; four regiments only armed with lances.

"As more experience was acquired in the war it came to be recognized that without a good cavalry, decisive successes could not be hoped for, and that arm, at first subordinated to the others, became the spoiled child of the government and the country. From the second year of the war, more money was spent on the cavalry than on the infantry and artillery." (Colonel Lecomte.)

The raids and long marches of the cavalry were also one of the causes of this infatuation. The American horse, raised in full liberty on the prairie of the West, was hardy and inured to fatigue; he rendered excellent service, especially in advance guard and reconnoissance. What the cavalry lacked most of all was capable officers. In the elections, the man who knew most about riding a horse was selected. This is not a sufficient qualification, and it was found necessary to remove many of them. The cavalry officer has such great need of various qualities, of an instruction so wide and complete, that he must be endowed with peculiar intelligence and aptitude to succeed in that arm. Stoneman, in spite of all his efforts, could not execute a movement with cavalry; negligée in his appearance, he was a brilliant forager, but was never good at regular movements.

In the South conscription was almost immediately established; this being almost the only difference between the two armies, which had about the same organizations. At the battle of Manassas, or Bull Run, the Confederates regretted very much that they did not have good cavalry, which, on the 22d of July, would have increased tenfold the results of victory, since the Federals, being completely routed, were able to rally under cover of a few regiments. They set themselves then to form numerous regiments of cavalry; those of Virginia with their Generals, Stuart and Morgan, particularly distinguished themselves.

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The cavalry of Stoneman (at Fairfax Court House) carried its reconnoissance as far as Manassas where they found out that the camp (Confederate; Centreville to Manassas) had been abandoned. The following day the advance guard arrived at Manassas Junction, and the cavalry continued to beat up the country in front. On the 14th of March a reconnoissance, directed by General Stoneman in person, came up with the enemy's rear guard in the neighborhood of Warrenton. Some skirmishing took place on Cedar Run and it was learned, from prisoners taken, that the enemy had taken up a strong position in front of Gor-

donsville. The cavalry had that day separated itself about 65 kilometers from the advance guard at Manassas. Notice this spirit of decision of the cavalry general from the very beginning of the war. We see nothing comparable to this in 1870 and 1871, either on the French side or that of the Germans. Information was needed; the cavalry, undertaking its true *rôle*, went out to see. How different from the inaction of the one and the tranquil and methodic march of the other in the Franco-German War, and besides the European cavalry were operating in a country admirably covered with a system of good roads.

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The Confederates (at Williamsburg) awaited the attack behind their breastworks. Stoneman ordered forward his four batteries of field artillery, which in spite of their weakness compared with the large guns in the enemy's redoubts did not hesitate to shell the Confederates; he then advanced to the charge with the cavalry, attacked the infantry with sabre and forced a retreat. Some squadrons pursued the Confederates and captured their trains and seven or eight guns. The cavalry in front made numerous reconnoissances, and often had encounters with the enemy. In the evening the officers came to report what they had seen to the general staff, all showing the greatest activity and initiative.

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In the fight at Wilson Creek * * * there were several charges by the Confederate cavalry, with always the tendency to outflank the enemy which we noticed against Sigel. In that affair the Federal artillery prevented the success of the movement, This flank movement was particularly effective in a war where provisions were difficult to secure as soon as the command left a navigable river or a railroad. The capture of the train could cause starving out and complete destruction of the enemy.

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The author speaks of the well-known charge of Major Zagonyi, a former Hungarian officer, as "worthy of the most brilliant work of our cavalry of the First Empire," and concludes a detailed description of the charge by saying "this episode shows what can be done by audacity and initiative;" this last quality, an American one, was the cause of the brilliant employment of that arm (Cavalry) in the War of the Secession, and we see that it not only accomplished all that could be expected of it in any war, but that there it was absolutely indispensable and without it the war would have been much longer than it actually was.

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The cavalry did not accomplish much worthy of notice in the operations to the south of the Ohio. However, the cavalry of Forrest, at the surrender of Fort Donelson, bravely cut through the Federal lines and succeeded in escaping. The Federal cavalry did not properly guard itself and did not do outpost duty. The surprise at Shiloh took place

because the cavalry was all in one camp near the river. That of the Confederates showed itself much more brilliant and more active, covering the retreat at that same battle (Shiloh), and overwhelming a Federal regiment. The strength in cavalry was almost equal in the two armies, being about 4000 in each case.

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We must (here) give some details concerning Stuart, one of the most brilliant of American Cavalry Generals. Stuart was a West Pointer, and an officer of the army when the war broke out. He had no difficulty in organizing in the South a considerable force of cavalry, in the neighborhood of Richmond, whence he could draw the necessary supplies. He was never independent and served more in advance guards, than in making raids. Lee considered him indispensable. At this time (7th August, Culpepper) his division was composed of nine regiments.

On the 20th of August Jackson again crossed the Rapidan at Sommerville Ford, while Longstreet crossed it lower down at Racoon Ford. Pope, forewarned, had retired on the Rappahannock, leaving his cavalry in observation. Lee followed him and, while Longstreet guarded the right bank of the river, Jackson, preceded by Stuart, marched up the river to turn the right flank of the Federal army. Stuart, who had crossed Waterloo Bridge with three hundred cavalrymen, reached Catlett's Station by forced marches; he there seized a wagon park and carried off the papers of Pope, in which Lee found precious information. He then returned by the way he came, escaping from the 12,000 or 15,000 troops encamped in the neighborhood, after having disorganized the trains and railroad service of his adversary; a very serious matter, if we remember the difficulty the troops had in obtaining supplies. He also caused alarm and excitement all along the line, and among the trains, which, in bringing up reënforcements the next day, did not dare to pass Catlett's Station for fear of the Confederate cavalry. Jackson, continuing his Northward march in order to flank the Federals, quickly arrived at Salem, and debouched on the flank of the enemy through the defile of Thoroughfare Gap, while Stuart with his cavalry, who had constantly covered his (Jackson's) right flank, crossed the mountains to the south of the defile by paths which, to others, would have seemed impracticable, and continued to mask the movement.

He had not, however, been able to cover the march of Jackson so well that it was not eventually discovered by the Federal army's "Signal Corps," an invention quite American, and which rendered great service throughout the war. By this means information arrived surely and promptly, and thus was solved that question so difficult in war—How to get the news to hand in time.

Pope did not realize the importance of this movement of his adversary, and he sought to attack Longstreet, while Jackson, preceded by his cavalry, arrived on his (Pope's) lines of communication, and Stuart cut the railway telegraph line at Bristow Station, preceding his Corps

Commander who was firmly established on the line of the railroad. Jackson's troops had covered 80 kilometres in 36 hours. Stuart, supported by two regiments of infantry, was directed to move, without stopping to rest, on Manassas, the base of supplies of Pope's army, which he captured without casualties, and where the Confederates secured immense booty, especially in rations; all that could not be carried away was burned. The cavalry constituted an impenetrable curtain around the movements of Jackson; and Washington was in a trance, not knowing what was going on, nor whether it was not the entire Confederate Army between Pope and the city.

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In this battle (Antietam) Pleasanton, who commanded the Federal cavalry, rendered very useful service to his army, by occupying a ford over the Antietam, which permitted one of McClellan's corps to cross the river to the enemy's side easily, and by supporting the attack with his guns.

The Confederate General Stuart came also prominently to the front, when the issue was very much in doubt, by checking the Federals, whom he took in the flank and enfiladed with his artillery, at the instant the Confederate lines began yielding to their attacks.

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On the 10th of October, General Stuart, with a corps of about 2000 cavalrymen, comprising the three brigades of Hampton, Fitzhugh Lee, and Jones, and a horse battery of four pieces, made one of those raids which were so characteristic of this American war. He debouched by the ford over McCoy's Creek on the positions on the Federals' right, surprised and captured several advanced posts, among others that of the Signal station, between Hancock and Hagerstown, driving back others; blinded his trail by marching in different directions, and, while he was still thought to be on the banks of the Potomac, he advanced via Harrisburg, Pennsylvania, as far as Chambersburg, where he captured the military stores.

McClellan immediately made his dispositions to capture the Confederates. General Averill's cavalry, which was on the upper Potomac near Green Spring, was sent directly in pursuit of the Confederates, following their track; General Pleasanton's cavalry was sent to Mechanicstown (burg?) to follow the enemy and cut off his retreat; he was also especially charged with guarding the fords below the enemy. The greatest watchfulness was ordered in all the posts of the army between Hancock and Harper's Ferry. Cox's division, which arrived from Virginia by rail, under the orders of General Crook, was halted at Hancock, the men remaining in the cars, so they could be immediately forwarded to any desired point. Burnside had two other brigades put into the cars at the forks of the Monocacy, ready to be transported rapidly wherever they were needed. Lastly, General Ward guarded the crossings near the mouth of the Monocacy, and those down the Potomac. The roads

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for returning appear to be very securely closed against the Confederate General, who, it seemed, would have a difficult task to break through the circle thrown around him. Stuart by various means was still able to cover up his tracks, in the neighborhood of Chambersburg, and on the 11th he marched on Gettysburg, and then on Emmettsburg, carrying away a rich booty in horses, wagons and supplies, after having destroyed all that he could not remove, even to the stores and railroad station. That evening he reached the Baltimore and Ohio Railroad near Frederick, tore up the rails and cut the telegraph wires. The next day, continuing his route via Hyattstown, Barnesville and Poolesville, he arrived on the 12th at the ford of the Potomac, at the mouth of the Monocacy, without meeting any resistance. Checked at this point by Ward's troops, and attacked by the advanced guards of Pleasanton's cavalry, he went, after a slight skirmish, to cross the Potomac, three miles further down, at a ford which had been abandoned by the Federals. Pleasanton only came up in time to fire a few parting shots, which did no great harm. Stuart lost in this raid only five men; he had covered 150 miles in less than three days. Pleasanton had been not less rapid in his pursuit, and only missed his adversary by a few hours; he had, however, broken down a number of horses, in order not to lose time. Six regiments had made 55 miles (88 kilometres) per day, and the rest of the cavalry had made 78 miles in 24 hours (126 kilometres).

It has been said that Stuart was lucky in this hazardous raid; is that exactly the word to employ? It is certain that he displayed throughout, in the highest degree, all the qualities of the partisan, and if he found a ford unoccupied, does not something of this nature always happen to those who are audacious? And if the ford was abandoned, was it not because he had known how to change his plans?

(*To be continued.*)

LESSONS OF THE SPANISH-AMERICAN WAR.

By D. VICTOR M. CONCAS, Captain in the Spanish Navy and Vice-President, Geographical Society of Madrid.

(*Concluded from* Journal M. S. I., *March, 1902.*)

IT is not the least of the errors of Bonamico to suppose that in Madrid there was a directive council of war like that which in Washington directed the operations of the American squadron, for in Madrid scarcely ever did the Minister of the Marine take the initiative in that which pertained to his department.

It is true that to determine upon the sortie of Admiral Cervera's squadron there was a reunion of Admirals, to which were called those held in reserve, including those retired from service, a number of whom never had taken part in such proceedings, and the reunion was to con-

sider a concrete question, the response to which had been prepared beforehand.

To give a clear view of this state of affairs, there is nothing more expressive than the words of Counter-Admiral Pasquin, senator of the kingdom, ex-Minister of the Marine, and actually retired by age from active service. He says thus: "Before each gives his opinion, it is important to know if it is the government which has convoked us as a Council of War, or whether it is only a companion who invites us to express our individual opinions, because in the first case each one is responsible for that which he utters, and in the second our utterances have no other value than those of a council of friends; and, at all events, having been convoked without the object being specified, no one has been able to make preparation for the explanation of plans of the requisite gravity and importance."

That is to say, they did not know whether they were a Junta or a reunion of friends, without notification of the object, without preparation, and called by politicians on the part of the Admirals in active service.

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There was not, then, in Spain a Board of any class, and the premature deaths of the Ministers of Marine and of War of those days, show how the difficulties affected the men of honor whose memories history will elevate in making saddest comparisons. Under those conditions, Cervera was not voted to sacrifice, without meriting the respect from his enemies, which the grand figure of the Spanish Admiral has deserved. Cervera was a soldier, ready to give his counsel when it was permitted and to obey when ordered. But he did not desire to become a martyr or a suicide, to follow the singular pretension of the Italian critic, knowing that he went to the disaster with the greatest possible dispatch. Never was the Admiral disposed to make a useless sacrifice, especially a sacrifice which would leave Spain at the mercy of her enemies, and the doing which by order of another authority has expunged from his honored name the sad comment of having been the one who closed the colonial history of Spain.

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Compare the description of the combat made by the American captains and inserted in the Brassey Annual of 1899, and mine, and there will be seen their accord with that of those who were our enemies, who honorably write of the successes; and analyze that of Admiral Sampson.

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The conditions of the entrance to Santiago were such as would impede Sampson from forcing the port; such conditions as made a sortie by night absolutely impossible; the same conditions made a disembarkation of an army necessary, at all points unnecessary in Cienfuego and Havana, for distinct reasons; for the American army only had to disembark to take the mouth of the port, and that is what should have

been done and not to go to Santiago. * * * More than that: the population being captured and the mouth of the port not taken, Admiral Cervera's squadron could have retired with impunity before all the American army, while if the mouth were taken and the torpedos removed, the large cruisers could have entered one after the other, and consequently, as is probable, though not without punishment, Santiago would have fallen into their hands. * * *

If General Linares had had at least a half dozen modern guns of war with which to defend the slopes of Sevilla, the American artillery would not have advanced with the impunity that it did, and when neither at sea or on land was there a cannon that merited such name, against artillery the best in the world.

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Certainly it was the general-in-chief who gave the order for the sortie of the squadron when, after having asked that it be sent there, he put into Santiago, the day of our arrival, five bronze cannons of 1724 and into Cienfuego two of 9 c/m Krupp, certainly all that he could make avail of, although the ruin of the squadron entailed that of Spain, not that of Cuba alone, as is equivocally supposed.

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In regard to the Philippines, those islands were lost to the white race the day when the Japanese won the battle of Yalu; and the revolutionary propaganda, the lodges; the uprising and the easy campaign of the Americans against Spain are not more than incidents of a drama not yet terminated and whose ending will be the passing of the islands to the dominion more or less direct of Japan, a result that is possible to occur years before it would have occurred had the Philippines remained under the banner of Spain.

The eternal ditty about the atrocity of the Spanish colonies before slavery, and the tyranny of the Holland. French and English colonies, is not to be tolerated without an energetic protest, for none in the world have done more than Spain with hers in the Philippine islands, where we civilized and christianized all the indigenous population, whose municipalities could serve as model for many European people. We treated the Indians as equals, living among them with perfect confidence and with all the means of culture of Europeans and their progress has decidedly felt the influence of Japan, of whose race are the Tagals, not merely first cousins, but they are of the pure race and all the families which form the ancient aristocracy of the Island of Luzon are called Japanese.

Really, the islands are not to-day in condition to govern themselves, which presents a grave problem for the United States themselves, for the fruit is green for them and is not sufficiently matured for the Kingdom of the Rising Sun; which circumstance and the concatenation of successes would furnish a beautiful study of lessons which nevertheless no one has yet undertaken to pursue.

Not less ridiculous is the pretension that the Island of Cuba would be more prosperous in other hands. In the case of San Domingo, Hayti and all the Lesser Antilles, have they not the same territory and the same conditions as the Island of Cuba? Notwithstanding that and its vaunted prosperity, all the juntas have not been able to produce that which Cuba was when she was Spanish.

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In the case of Jamaica, that insult to civilization, ignominy of England, where is found only two and a half per cent. of whites, has it not the same conditions as the Island of Cuba? And the Island of Porto Rico, of equal prosperity with the Greater Antilles, does it possess a secret that is not possessed by the neighboring islands?

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The great secret of the Island of Cuba was that it was, though in less proportion, the unique territory of the tropics in the whole universe that could call itself peopled by the white race, in immensely larger number than that of color, and to which was due its prosperity, which situation was maintained by the Spanish emigration, but which will surely in a very short time disappear little by little.

These circumstances: the impossibility for the whites to work in certain districts, especially in the field; the concentration of the blacks in the towns, though less in the eastern department; the rapid disappearance of the African race; the pronounced change in manufacture and in agriculture since the suppression of slavery which greatly modifies the form of the public wealth; the aggravation of the system of usury, styled a system of restitution (rebate?); the general greed accustomed to a minimum interest of an eighteen per cent.; the incomprehensible inequality between the wages in the field and in the cities, and the almost radical transformation of an immense number of families constituted of individuals of distinct races, does not present in Cuba the known problem of races which obtains in other parts, but the social problem of a race which cannot live in the tropics without certain conveniences; among whom are to be counted rich and poor, and which is synonymous with being negroes. And here is the important part which woman took in the rebellion, for as there were born in the island many more women than men, the white woman who would be resigned to be poor did not resign herself to be a negro, and the difficulty of the situation was modified without, however, taking into consideration that the climate which is injurious to the whites is just as injurious to those who are not white, they being the first victims of their blindness to this state of affairs.

From what we have explained are derived the characters of the struggle, sometimes like the agrarian wars of the Middle Age; and at others a struggle for the uplifting of a mass of people which elsewhere would have been contented with the humble lot assigned them by fortune. The Spaniards did not pick up their wealth in the street, but obtained

it by their labor, without counting the dangers, nor considering how many the cruel climate sent to the cemetery; and that was the secret of the Island of Cuba, of its wealth, of its prosperity which it will never regain, just as Santo Domingo never has regained that which it possessed while in our hands, when it was what Cuba was in 1894.

In that condition of great perturbation, the Island of Cuba had been lost for years, as almost all the Governors General said confidentially to the Spanish Government. From this state of affairs arose the economists, the reformers, the autonomists; and the Island of Cuba rapidly underwent a change in political existence from being that enormous mass of peninsulars, who, though debilitated by the reform rendered the solution more difficult.

Indeed, the resulting problem in the Island in 1898, the war with the United States, scarcely had any significance; and really it only took Cuba from Spain, who already considered it as lost; but the Cubans, much freer than they are to-day, maintained their right to independence, no matter what might be the consequences; and the great wonder is the little that the American squadrons accomplished with their colossal mass of force, with elements and resources of all kinds at their very door.

Well, indeed: the incidents concerning Spain, all have been brought about by the Spaniards, and especially the anglo-maniac Spaniards.

From the beginning of the century Spain has been playing with France and England, whose enmity or alliance were alike sad for Spain, as Bonamico says, regarding the former: Since the Napoleonic invasion anglo-mania took root, especially among the higher classes and over all Madrid and in the centres of higher culture. It is certainly not solely the fault of the men of '98; the evil came from a greater distance, extended to all the governmental parties and to those who did not govern, so much so that surely whoever might have been in power on that sad occasion. would have committed similar errors.

We will cite some opinions which we cull from the admirable letters of Ortiz del Barco. For instance, Canovas del Castillo, chief of the conservative party, said on November, 1889, in his discourse in the Atheneum at Madrid (page 76): "The United States in its entirety constitutes one of the most excellent creations ever realized by man." Taking the opposite party, the chief of the Republican Federal Party, Señor Pi y Margall, in his work *Las Nacionalidades* (The Nationalists) says that: "The United States are the most powerful nation of the world where justice and right are observed."

And Castelar, known by the entire world, says in his "Polemicas": "There in the Atlantic arises a world in which only liberty is possible, a world more beautiful than antique Europe, created by God upon a new idea."

We copy these notes from a most intelligent writer, not seeking to cite all the men of the day, for all have fallen into equal error.

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This is a most beautiful collection of lessons to study, which hardly any Spaniard of to-day will undertake, but which without doubt posterity will take in hand; studies social, political and military, of positive lessons, not light studies mostly of an equivocal foundation. * *

And that marine, naval opinion, strategic, political, as an arm of a social entirety whose irresistible force, if coming from the *market place*, is to be felt at the most crucial moment, has much to study, to meditate and to learn of the lessons of the Spanish-American war; lessons that as yet no Italian has written.

Bilbao, December, 1900.

A PEACE AND WAR MUSEUM.

AT the close of a series of lectures on "Lessons of the War in the Transvaal," delivered recently before the Royal United Service Institution, M. de Bloch, the distinguished Russian writer (since deceased), made the following remarks:

* * *

From the discussion which has taken place, we saw that each member stood primarily for the defence of his own arm. This is, of course, most useful from the specialist point of view; but it suggests other reflections, that is—how difficult it is to find anyone who will take a comprehensive view of the whole subject of war, not merely in regard to the co-relationship of the various arms, in the strict sense of the word, but also in relation to those financial and economic resources, without which the continuation of a war long enough to obtain decisive results would be impossible. I think myself, and have long thought, that the *ensemble* and philosophy of war is a subject in which every nation needs to be educated. The political histories taught to children, and the military histories studied by specialists, throw no light on this problem. Nowhere do we find any clear notions of what war is as a social phenomenon, or even in the *ensemble* of its details. But war is not merely a series of military operations, but a great social appearance which has its ramifications in every branch of life, and the consequences of which are every day being absorbed as integral parts of the history and evolution of every nation.

Now, to deal with this science no method has ever been created. In England, and elsewhere, we find museums, such as the interesting museum attached to this Institution, which deal either partly or wholly with war. But these museums are mainly historical; their chief object is to preserve objects of accidental interest, and they neglect altogether the exposition of war and its social phenomena to-day. It is the same in military exhibitions. In London at the present time you have two of these, but both are spectacular and formed for amusement and to satisfy curiosity. Neither from museums nor from exhibitions of this kind can

you learn anything as to what war was in the past compared with what it is to-day. I have studied in many museums and exhibitions, and I have always been struck by the fact that, as if intentionally, every object showing the changes which have taken place in war has been, so to say, hidden, even when chronological collections are shown. A soldier perhaps, by sacrificing much time, may extract from them a little light; but the ordinary mortal, never. Once only, at Buda-Pesth during the Exhibition, I saw a small military section which dealt with the subject in a scientific light, and my own experience of it was that from this collection it was possible to learn more in a few hours than from the study of books for years. I watched the impression created upon the general public and saw what great value such optical teaching had for the cause of peace. That is what is wanted. Its use is not only for the ordinary public, but for statesmen also.

We have heard here the complaint that statesmen refuse to grant credits for the most indispensable military needs. But that naturally arises from the fact that money is every day demanded for fresh improvements which cost millions: the argument being always the same, absolute necessity. Before these credits are exhausted more money is demanded for throwing into the gulf—a new invention, a new improvement must replace the old. But if the elements of the mechanism of war could be easily studied, many of the frivolities, let me say many of the manias, which cost millions, would be avoided. Even for soldiers such an institution would be of great use. The military man is an artillerist, an infantryman, a cavalryman, an engineer, but the *ensemble* escapes him. The science of war changes every year. The higher grades of officers learnt the elements of the military art long ago, a colonel perhaps 25 years, a general 35 years ago. Do they keep their knowledge up to date; have they time for it; and can they do it, as they often have to, only by the dead letter of books? The younger officers have learnt more, and have studied models in the schools. But they dare not give an expression of opinion, which would not help them in their careers, but must keep silence. That is why even for soldiers a lesson might not be without use. But above all, what we want is to show to soldiers and civilians something of war as a whole, with a representation of its technical, economic, and financial sides. I may say that my conviction as to the importance of such study is in no way new.

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The object-lesson created by a scientific museum of war would prove of great value for the world's peace and also for England. But another motive not of less importance pleads for the creation of such an institution in England; that is, that it would to some extent teach civilians something of the art of war. Whatever else be disputed, it cannot be denied that the Transvaal War shows what excellent soldiers civilians may prove themselves to be. We all know what the Boers did, and we see that they showed their superiority even in the scientific side of war,

such as entrenchments and fortifications. This is not because the Boers had no training, but because each used his individual intellect. Yet the Boers had their defects. The United States attaché, Captain Reichmann, said that although still fine shots, the Boers are no longer such excellent marksmen as of old. They are still hunters rather than soldiers, and will not hold a position to the last. Their most serious defect was the lack of military discipline. When a movement was proposed which was not agreeable to the men, no officer would make a move, consequently many well-planned affairs were ruined. Politics play a great part in the election of officers. Inferior officers act on their own initiative to a degree which almost passes belief.

England might have a national army in which the defects of the Boers would be corrected; but their good points, individual initiative, and capacity for adaptation to new exigencies of tactics, preserved. We are told that at the schools the methods are right, but it is necessary very often to instruct the instructors; and it is necessary to awaken public interest in the science of war. For these reasons an institution such as I have sketched is indispensable for England. The Government itself might create it, but there is reason to fear that this might result in the distortion of the technical side and the suppression of the economic side. It seems to me, therefore, that the Royal United Service Institution might take the initiative in creating the institution of which I speak. I do not believe that there would be much difficulty or any risk. You would find many men who would labour willingly in such a work. I have already myself taken the initiative abroad by founding a Museum of Peace and War in Lucerne. For years past I have been engaged in the study of how best to present at once scientifically and simply, all the questions involved in war. The materials are ready, and you may see on these walls some specimens which show the general idea. For the special section, which is a representation of the differences between the phenomena of the South African War and those of former wars, I have elaborated a programme which I propose somewhere to publish. There may be defects in this, but *la critique est aisée*, and you could easily correct and improve my work. But in any event you would do much better than I; and particularly in regard to the South African War you are in the best possible circumstances. The high position occupied by your Institution is an especial reason why the initiative might be taken by you. My own belief is that the execution of such a project would not be very costly, and I calculate that some £10,000 would cover the expenses, especially if your Government would coöperate by lending objects and new instruments of warfare, which could be returned, if required, at a moment's notice. In regard to the locality, the building of the Royal United Service Institution would be admirable if it were not that enough space could not be obtained, for it would be necessary to represent on a large enough scale different methods of warfare, such as entrenchments. My own belief is that with a small entrance fee, a fair

interest would be paid upon the capital, and a further profit brought in which could be employed towards increasing the stock of objects, and keeping the Museum up to date, such being an essential feature. In conclusion, I may say that if such a Museum is founded, I should be very glad to present copies of all that I have had made for the Lucerne Museum. I need not say that controversial questions should be avoided, the only object being to show war as it has been in the past and as it is to-day.

I will only add a few words for those who think that this proposal is not in accordance with my own desire, which is to avoid the outbreak of war, and to find other means to solve the disputes of nations. What I should say is that the greatest enemy of these peaceful tendencies is ignorance, and an institution with the objects of which I have spoken would be the best means of combating it.

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CHARACTERISTICS OF THE KAISER'S ARMY.

(*London Daily Mail.*)

IT was the German soldier who had brought me to Koenigsberg. The entire First, or East Prussian, Armée Corps of the kaiser's army was concentrated here, ready for the kaiser's review, which was to mark the commencement of the season's manœuvres. The First Army Corps was to be only a part of that portion of the German army whose turn had come to engage in the annual exercises. It was to represent the attacking force which, supposed to be advancing from the east, was to endeavor to cross the Vistula one hundred miles or so to the westward and to threaten Dantzig, where the defending army corps has its base.

I saw a good deal of the German officer on the evening of my arrival. The dining-room of the Deutsches Haus Hotel was full of him.

You cannot miss seeing him. He takes up a great deal of space, both individually and collectively. He is exceedingly taking to the eye, very stalwart and upright, frank of face, but fierce of upbrushed mustache, blue-eyed and fair-complexioned but with a most impressive air of conscious authority and greatness.

His authoritative dignity is so great that he does not seem to forego anything of it even when he is drinking beer out of a long glass. The respect and deference he commands are wonderful to see. Civilians, even compatriots of distinction, on entering the dining-room bow to him with formal humility. He acknowledges the obeisances only with a rigid glare of haughty indifference, though he is politely conscious of the coming and going of ladies. The German civilian does not appear to be surprised at nor to resent being contemptuously ignored by him,

but recognizes him and looks up to him as a superior member of a superior race, and continues to make his obeisances, however loftily they are ignored. But while he is unable to see a civilian at whom he is looking point blank, he never misses observing the entrance and acknowledging the salute of another of his own race. Gog and Magog at the Guildhall could not be more stolidly unconscious of the presence of a county councillor than he is of a mere civilian; the maitre d'hotel at the Carlton could not be more ceremoniously polite on the entrance of a distinguished habitué than he on the appearance of an officer of superior or equal rank. He rises from his seat and stands stiff and erect while the new comer advances and exchanges formal bows with each in turn. And as he recovers the erect position from the bow he brings his heels together with a sharp parade click and waits until his superior has taken a seat before he resumes his own.

Then there were tremendous ceremonies in eating and drinking—especially in drinking.

Each table group lifted their glasses invariably together, as if at the word of command, taking their time apparently from the senior present. Having seized their glasses together and raised them together and simultaneously drunk they would simultaneously finish, and then, holding their glasses before them would with great ceremony bow to one another before replacing them on the table. It did not matter whether they were drinking beer or claret, or the German champagne which seems to be the especially smart thing to take, there was the same ceremony.

When a senior officer went out of the room all the juniors present rose to stiff attention and bowed as he passed. When a junior rose he made the round of the tables on his way to the door and bowed separately, with a spur-jingling heel click every time, to every other officer.

It seems strange, all this formality and ceremony—strange to an Englishman accustomed to the free and easy way in which the English officer off duty and in mufti comports himself toward his fellow-officers and the rest of the world alike. But then the German officer is never out of his uniform and never removed from the discipline and responsibilities which it carries with it. He may sit in a café and drink beer at a penny a glass, but his uniform calls upon him always to sit in his café with the distinction of his rank and drink his beer with its accompanying ceremony. It all seems at first just a little ridiculous, but it has its obvious good points.

And certainly you soon recognize that the German officer is a very fine fellow. He has all the high swagger of our own guardsman and all that appearance of confident capacity that impresses us so much in our own naval officer. He has the air of a man who knows that he has thoroughly learned his business, and he has also a good deal of the sailor officer's frank, open-hearted enjoyment of life, and to hear him laugh reminds you of the wardroom.

Of what he can do I hope to be able to see something later on during

the manœuvres, but at present I am quite sure that he does it uncommonly well.

Outside in the crowded electrically lit street I saw something of the soldiery. Round about the schloss where the kaiser and kaiserin had taken up their residence, there were crowds of soldiers on duty.

Very rigid barricades did the line of Prussian soldiers in their blue coats and spiked helmets make against the press of the crowd. Very sturdily built, what our soldiers call "hefty" looking fellows. If their ancestors were the same you can imagine them being irresistible with the pike.

As to the men, they were a clean-looking, healthy-looking, honest-seeming crowd as anywhere one could wish to find. Not a drunken soldier did I see all the evening, not a single instance of anything approaching the boisterous, much less the rowdy. They laughed, they were jovial together, they exchanged good-humored remarks with the civilian passers-by, but no sign of misconduct. They were not on duty. Only the rigid lines of soldiers with set faces about the schloss were on duty. But perhaps there is something in German discipline that carries value beyond the drill-ground. And then conscription, though no doubt a terrible thing, has one effect in raising the standard and improving the behavior of an army.

At 12 o'clock there was still a crowd, but a thinning crowd before that side of the schloss where lighted windows marked the imperial dwelling. But they were waiting with little hope of seeing anything, for to-morrow was the review and the kaiser would be sure to be early astir. The cafés and bier-halles were still open, and from them came sounds of plentiful laughter, but no drunken laughter. I wonder whether that terrible conscription, while it may improve the manners of the army by raising the class average of the army, can also do something to improve the conduct of the people at large. Perhaps discipline may wear a long way and a long time after the parade ground has been left.

GUERILLA OR PARTISAN WARFARE.

By T. MILLER McGUIRE, M.A., LL.D.

(The United Service Magazine.)

HORSES AND TELEGRAPHY.

I SUPPOSE our readers are now beginning to admit that we were fairly right when we pointed out again and again for the past five years that the whole causes of our losses are ignorance and apathy, and fashionable influences in the headquarters. The Cabinet and War Office were about as fit for the conduct of war in 1899 and 1900 as I am to navigate a yacht. The ignorance that prevails in official circles even now of strategy, tactics, guerilla warfare, military law, military

honour, the resources of our own Empire, the resources of foreign countries, is, to use the words of one of our best educated generals with whom I was discussing the matter lately, abysmal. Great surprise is felt or pretended at the remount exposure, and Sir B. Maple, instead of having a monument erected in his honour at the public expense, is grossly abused for exposing what we have known for years, *i. e.* that no branch of the War Office is efficient, nor can be as long as grossly ignorant society darlings get high places, and as long as no proof of special knowledge or general information on the part of officials is expected, I doubt exceedingly if half our remount staff or our Cavalry officers in 1899 knew either the geographical position or the resources of Hungary, or the Argentine Republic, or the Mississippi valley. I know this, that not half the so-called Yeomanry ever groomed a horse in their lives till they got five shillings a day for beginning to learn that business. I also venture to assert that most of our public schoolboys, who are getting commissions in the Cavalry and are sent to the front, are more ignorant of horse-management than the majority of Arnott & Co.'s shop-boys—these would be better fitted for the position in many ways.

Ignorant and weak gentlemen, if an ignorant man can be called a gentleman, are less fit for Government employment than educated strong sons of peasants! Yet our Yeomanry are the kind of people that are lectured for not crippling the Boers; the whole Yeomanry arrangements—staff-officers, privates, horses—have been an iniquitous scandal from beginning to end. Of course, the poor victims who are sent by ignorant officials, under ignorant officers, on wretched horses, to fight clever Boers and die, display endurance and courage—all the more disgrace to the authorities who waste both them and the country's revenues. No one ever said that any kind of Briton would not fight well—if he could only get some persons to treat him, teach him, and to lead him properly.

Our readers may remember that we described how Morgan, the confederate guerilla, used to tap the wires of the Federals and read their orders and send contrary orders, and thereby perplex and amaze them to the last degree. It is certain that the Boers knew much more about guerilla warfare, as both the German military magazines and Councillor de Bloch pointed out, than our staff; and if Messrs. Methuen's new publication, 'With Steyn and De Wet,' by Pienaar, tells the truth, our officers have been grossly befooled by the skilful use of this gentleman's vibrator. Here are a few sample anecdotes—is it not enough to make the very stones to rise and mutiny against our military system and the insolent and ignorant official folk, who are responsible for the whole mass of absurdities under which we groan? Yet their servile majority in Parliament, while calmly permitting the utter ruin of officers who have no interest, for trifling blunders, do not insist on full inquiry and retribution for stupendous neglect and the ruin thereby of hundreds of soldiers and the loss of millions of money.

For example, after General Hamilton had occupied Heilbron, and when Mr. Steyn was shifting the "capital" every day, Pienaar tapped the wires near the town and picked up the English messages. "'From Chief of Staff Honingspruit,' came the words, 'to General Hamilton, Heilbron.' Then followed orders. How Hamilton was to march from Heilbron, how Broadwood was to move from Ventersburg, the entire plan of campaign for the next few weeks. A mass of information to gladden the heart of our steadfast chief. 'Hurrah!' we whisper to each other, as I carefully put the precious message in a safe place." The next day Pinaar was again at the wires. "The net result of the morning's work was the knowledge that Hamilton was leaving Heilbron at that very moment, and leaving it unguarded. This information I hastened to convey to my chief, with the result that within a very short space of time we were again in telegraphic communication with that town, and in possession of several hundred sick and wounded that the British had kindly left to our care." This is bad enough, but even more significant is the following extract, which, if there is any truth in it, throws a good deal of light on a question which has been argued. Pienaar says :—

"The capture of the Yeomanry took place about this time. There have been several attempts to explain this affair. It was said in our laagers at the time that Colonel Spragge, immediately after his surrender, remarked to our commandant that he would shoot the Lindley telegraphist if he could get hold of him, because the latter had tampered with his message, asking for reinforcements. This was quite possible, for at this time *most of the British telegrams passed through our hands before reaching their destination.* * * * When Rundle's force was at Senekal, and Brabant's horse at Harmonia, every one of their telegrams was read by a telegraphist attached to one of the commandos lying in the vicinity. Several of these messages were in cipher, it is true, but many were not. It was largely owing to information thus obtained that the British sustained a rather severe check when they advanced against our positions near Senekal. One would think the enemy would have taken strict precautions against their plans leaking out in this manner, but I presume we were considered rather too dense for that kind of thing."

Our readers will remember that the study of guerilla and mountain warfare was deliberately kept out of our educational course in spite of our protests in 1896.

As the *Globe* says in its criticism, these remarks of Philip Pienaar on wire-tapping are well worthy of attention, and of being carefully examined, to see exactly what amount of truth there is in them. Meanwhile, it is astonishing to note the hatred which this man, who writes English with so few blunders, and quotes Tennyson, bears to us, and the evidence he affords to the Afrikander conspiracy to drive Great Britain out of South Africa, which is still cherished by the irreconcila-

bles. He says, "Our women are women indeed, and worthy mothers of the race that shall yet people all Africa, and rule itself. Do not think I am flying too high. The average Boer family numbers ten children. Boys are in the majority. If at present we have thirty thousand warriors (I am not counting the wasters), it follows that in two generations we shall have three hundred thousand. Taking the proportion then, as now, of ten to one, Britain will have to employ against us in 1940 no less than three million men." Pienaar's arithmetic is sadly at fault, but the hatred which inspires him is obvious. It should be some one's particular care to see that he at least is never allowed to re-enter British South Africa. The book is a bitter commentary on the rubbish talked by pro-Boers of "peace by consent." The Boers, at any rate, are under no delusions, whatever may be said of their sympathizers in England.

But if the history of Algeria and North Africa generally was too little known to be a topic in our military class rooms, surely the history of the Balkan Peninsula might have been studied betimes, especially as it has occupied a prominent place in the attention of foreign soldiers and statesmen and journalists since 1850. Yet, I venture to assert that not one of our staff officers in three, and not one in five of our officials at the War Office, could give an intelligent account of either the campaign of Plevna or of the strategical position or guerilla history of Bosnia, Montenegro, or the great campaigns for possession of the line from Adrianople to Buda-Pesth; yet, surely this would be as amusing and profitable a study as golf or bridge!

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A GERMAN OPINION OF THE BOER.

A GERMAN officer, who served with the Boers during the first part of the present war, sends to the "Militar-Wochenblatt" an appreciation of the Boer as a soldier, which is both interesting and instructive.

The Boers, the German officer writes, undoubtedly possess many good, manly qualities; but, at the same time, show a great lack of the most simple soldierly virtues. Besides an utter absence of discipline, there is a complete absence in the Boer forces of an even more important factor, namely, of any sense of military honor.

The Boer is no way ashamed of remaining behind when his comrades advance to the fight; nor of falling out of the fighting line during an action to seek a place of safety, leaving his brethren hard pressed and in difficulty. The coward who thus acts is not regarded with contempt, nor even reproached; at the worst he would have to submit to a little gentle raillery. On the other hand, deeds of especial personal bravery are neither applauded nor held in any esteem. On the contrary, the Boer when he saw or heard of such acts being performed by a foreigner would

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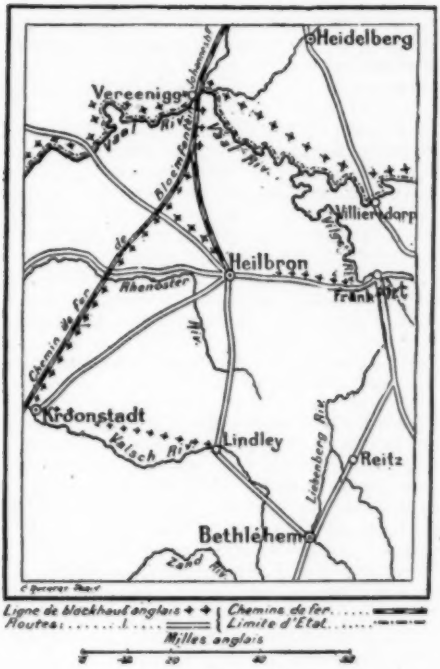
shrug his shoulders and declare that the doer must be stupid indeed to thus expose himself to danger. Similarly, if there were a choice between obtaining a secure cover or a good field of fire, the man who chose the latter would be forthwith denounced as foolhardy and improvident.

At the same time the Boer leaders understood very thoroughly how to utilize the admirable military spirit which existed in many of the corps of foreign volunteers, when it became a question of occupying an especially exposed position. The Boer commandoes themselves would flatly refuse to do so.

Despite this very outspoken condemnatory appreciation of the Boers as soldiers—at all events in the European acceptance of the word—the German writer acknowledges that in one special and separate section of the Boer forces examples of conspicuous bravery were afforded, and that was in the Boer artillery. The achievements of this force, exercised, trained, and disciplined in European manner, were all the more remarkable since it was distributed, gun by gun, among the various commandoes; each "general" insisting upon having at least one piece with him. Consequently no common control could be exercised over the scattered fractions; the employment of a number of guns for a common purpose could never be obtained; unity of action was impossible, the detached sections being obliged to take up positions, come into action and employ their fire, not as an artillery officer would desire, but as might be ordered by the leader of a commando.

Never before in the history of war has, the German officer concludes, the difference between a force trained and disciplined by Europeans, and a force recruited from the same sources, but untrained and undisciplined, and acting under self-elected leaders, been so strikingly demonstrated as in the Boer war. In the one—in the ordinary commando—an utter lack of discipline and cowardice; in the other—in the Boer Artillery—exemplary fire discipline and conspicuous bravery.

From the above, therefore, the author deduces that the South African Boer, drafted into a good military organization, trained and disciplined by Europeans, is capable of developing soldierly qualities in a high degree. He brings with him into the ranks expertness in shooting, a remarkable gift of locality, skill in riding and in the utilization of ground, and an elastic physique accustomed to privations of every kind, and these qualities form a good basis on which to work.



MILITARY NOTES.

LES BOEUFS DE DE WET.—"Ancient strategy is always the best, as we have just proven," General de Wet might have said, recently, after having, in the presence of the non-plussed English, revived the operations of Hannibal, and crossed, in the face of his pursuers, the circle of block-houses which, theoretically, were to put a sudden check to the soaring of the Boer chief.

These are the facts, as they were sadly telegraphed by Sir Kitchener, who begins to doubt the virtue of his Chinese Wall. It is a matter of *doubt* at least.

It was desired to capture de Wet at any price and, in order to do this, twenty-three columns had been sent in his pursuit.

The Boer chief was camped in the neighborhood of Reitz, in a somewhat mountainous region watered by the rivers Vilge and Liebenberg-Vlei. About the sixth of February, the English columns appeared in this region and forced the Boers to cross over to the left bank of the Vilge.

As indicated in the accompanying sketch, de Wet's commando then found itself inside the circle of block-houses beginning at Frankfort, extending to Heilbron, thence along the Bloemfontein railway to Johannesberg, along this road as far as Kroonstadt, and ending at the town of Lindley.

The only part not furnished with block-houses, between Frankfort and Lindley, was guarded by the English troops.

The latter pursued de Wet toward the west, and on February sixth, he ran against the line of block-houses along the railroad, with all his men, convoys, and animals.

The Boer general ordered his troops to scatter, keeping with him only a few men and the herd.

When, on the evening of the seventh, the two thousand men of his commando had passed like flies through the meshes of the net-work of wire uniting the block-houses, de Wet fastened lighted torches to the horns of his beef-cattle and sent the herd against the lines of wire, between Lindley and Kroonstadt. The net was broken; the block-houses could not stop the avalanche, and de Wet passed out as he pleased, having lost only twenty-five horses and three men.

The *Times* declares, on this occasion, that it is the greatest victory General Kitchener has won in a very long time. If this observation is not a piece of British humor, we must say that the *Times* is not hard to please.

Meanwhile, trains continue to be derailed between Kroonstadt and Johannesberg.—*Armée et Marine.*

MACHINE GUNS WITH CAVALRY.—During the past two years mounted machine-gun companies have been introduced into several armies, notably into that of Switzerland, and their proper organization and tactical use have been a matter of considerable discussion.

The purpose of these companies is to increase the fire effect of cavalry. The latest proposition, therefore, is to make them an intrinsic part of the cavalry squadron, and the first squadron of each cavalry regiment would then be organized thus: Seven officers, 25 non-commissioned officers, 12 mechanics, trumpeters, etc., 106 cavalrymen, 4 gunners, 8 cannoneers, 7 train soldiers, with 4 Maxim guns, 2 ammunition wagons, 3 provision and baggage wagons, 1 forge; requiring 168 saddle horses, 8 pack horses, and 14 draught horses.

The necessity for increased fire effect of cavalry was felt even in the Franco-German War of 1870, and it was then proposed to attach infantry to the cavalry, but the present idea of attaching mounted machine-gun companies serves the same purpose, and at the same time preserves the mobility of the cavalry. Historical examples prove and the best authorities conclude that these companies can only be of advantage to the cavalry and in no sense a hindrance. They make no changes in the tactics of cavalry, require no special handling, and merely raise the fire effect of the cavalry regiment.

WOUNDED IN SOUTH AFRICA.—Professor Küttner, an eminent German surgeon, who has served with volunteer ambulances in Turkey, South Africa, and China, has been giving the results of his observations in the field. He dwells upon the changes wrought by the introduction of smokeless powder. Formerly, the powder-smoke served, to a certain extent, as a protection to the opposed forces; but at present only a light haze rests over the battle-field, and even this is wanting in windy or rainy weather. In South Africa it often happened that slightly wounded soldiers, at the first shock of their wounds, sprang to their feet in order to run to the field hospital to be bandaged, and in the next moment fell down, struck by several bullets. For this reason, it was found impossible to begin to attend to the wounded before the end of the battle. All attempts to begin during the fight were fruitless. At Paardeberg, for instance, three surgeons and a number of ambulance-men were shot. The ambulance service generally did not begin until the close of the action, and then it was very difficult, owing to the darkness. After the

engagement at Jakobsdal, the service had to work until 4 A. M., because the rain and the darkness made it exceedingly difficult to find the wounded, not only because the khaki uniforms resembled the earth, but because many of the wounded crawled behind stones and bushes for fear of Kaffir robbers. Professor Küttner says that the fate of the wounded often depends upon the first bandage, and that after Magersfontein many lives were lost for lack of rational treatment.

WINTER MANŒUVRES.—It may not perhaps be generally known that in the Russian army manœuvres both by separate arms and by combined forces are extensively practised in winter, and under most inclement atmospherical conditions, as well as in the finer weather of summer and autumn. An interesting account has been lately published of some of these winter exercises, carried out in the early months of the present year by the brigades of artillery quartered in the Novgorod District. On the occasion referred to, the General Commanding the 1st Army Corps was present, and under his supervision an experiment was made in loading the whole of a battery, with its war transport and material complete, upon sleighs; moving it for some distance over a difficult, snow-covered country, and bringing it into action again.

The eight guns of the battery with their carriages were transported on sixteen sleighs, each of these carrying either a gun itself and one wheel, or a gun carriage and a wheel. Two more sleighs took the ammunition usually carried in the limbers. The ammunition and store and baggage wagons were loaded on other sleighs. Each sleigh was dragged by two horses, harnessed tandem fashion, with a driver on the leader. The whole battery, which was in action when the order was given, was transferred to the sleighs in six minutes. A march was then carried out for a considerable distance over deep snow, and the battery brought into action again in a distant position; the time elapsing between the arrival on the chosen ground and all the guns being ready to fire being again six minutes only. On the line of march the snow was at times so soft that the horses sank in it more than once up to their bellies; but, nevertheless, no halt was necessary, and the advance was continued without interruption. The General in Command expressed his great satisfaction with the result of the experiments, which, he declared, showed that a battery thus laden on sleighs could follow wherever infantry could go.—*United Service Gazette* (London).

A SWORD OF PIECES.—What do you think of a sword blade that contains a thousand sheets of metal? Yet they are not uncommon, and, as you will readily imagine, are of Oriental workmanship. Our painstaking, patient Japanese friends are the makers of them. The blades of these sabres are made from magnetic iron ores. The steel is produced in small, very thin sheets, and the workman begins by fixing one of them to the end of an iron rod, which serves as a handle. To this are soldered other small sheets, until the mass has a length of about eight inches, a width of about two inches and a thickness of a little more than a quarter of an inch. This bar is brought to a white heat, doubled on itself and hammered until it is down to its original dimensions. This process is repeated fifteen times. Four similar bars are then soldered together, doubled upon themselves, resoldered and heated, the operation being repeated five times. This process makes the superposed layers so thin that a sabre contains at least a thousand sheets of metal.

CAVALRY BITS.—In an article published in the *Journal Royal United Service Institution* Major Dashwood (late) 16th Lancers says that he dif-

fers from the recommendations made in the Imperial Yeomanry Report, believing that it would be a mistake to substitute the "Pelham bit" for the present military pattern. For the faith which he has in the bridoon, or snaffle, as opposed to the Pelham, he gives good reasons. As an ounce of practice is worth a ton of theory, it may also be noted that the bridoon, or snaffle, has been the mouthpiece which has been found most useful in South Africa. The author, for instance, of an admirable little work on "Patrolling in South Africa," writes: "Nineteen horses out of twenty go perfectly well without bits and with bridoons only in their mouths. Therefore, do away with your bits when they are not required." We trust, therefore, that before any definite decision is arrived at to give to the Imperial Yeomanry bits such as Pelham's, the matter may receive the fullest consideration, and the opinion taken, not only of the riding school master and of the officer who delights in parade riding and neatly executed parade movements, but also of the men who have seen service in the field, and have had opportunity, from prolonged personal experience, of forming a correct opinion as to the best mouthpiece for a horse during a campaign.

HEAD HUNTERS.—Far back in the mountain fastnesses of Cagayan, in Upper Luzon, is a tribe of irreconcilables known as Kalingas or "head hunters." An interesting sketch of these bloodthirsty people is contained in a recent account of an expedition into their stronghold, under the leadership of Senior Constabulary Inspector Frank Geere, stationed at Tuguegarao, province of Cagayan.

"The Kalingas," says Inspector Geere, "are non-Christians and very primitive people. Their intelligence is of a limited order, though they are sharp, shrewd, lithe and active. They war a good deal among themselves. They never sleep at nights in order to guard against attack. Their methods of attack are by stealth, hurling a spear from the dense 'cogon' at the unsuspecting traveller, stepping into his tracks from concealment in the jungle, and splitting his skull with a 'pinaparing' or head axe, a weapon with a concave edge and a long hook behind to aid in climbing mountains. The head of the victim is then hacked off with this axe and carried to the village, where it is placed on a pole planted in the earth, around which they dance, feasting in their houses for nine days."

"Their method of defense is chiefly planting sharpened poisoned stakes in the trails and grass bordering them, around their houses, or in other vantage places. They are said to sometimes poison water, but I do not believe this is a common practice. They take the women and children of their enemies captive. They are stalwart, finely built men, expert mountaineers, and their clothes are a gee string and a gaudy toga. Their arms are barbed spears, axes and wooden shields. They cultivate rice, maize, sweet potatoes, tobacco and other produce in small quantities, and the wilder ones grow only such produce as they need for their own sustenance. Those living in proximity to the civilized native are more industrious and less warlike, having adopted some of their customs, though not their religion. These have incurred the enmity of the wilder settlements, and are referred to in my report as 'friendlies.'"
—*Washington Star.*

Comment and Criticism.

"The Knell of the Volley."

Major-General Arthur MacArthur, U. S. A.

Fire action is a most important factor in the tactical solution, and American experience demonstrates the wisdom of utilizing all possible methods to develop the maximum of fire energy. Collective controlled fire, in the early stages of a modern battle, manifestly tends to this end, by assisting materially in preparing the way for advance, and in helping to carry attacking troops across zones swept by the tremendous fire of modern small arms, without losing cohesion, and in sufficient numbers to deliver a successful shock which alone can bring about a successful issue.

Long range fire by volley was frequently employed in the Philippines, and so effectually in many instances that the soldiers, by way of expressing their appreciation, referred to the process as "combing the bamboo," which expression arose from the fact that the action usually occurred across very wide rice fields enclosed by bamboo jungles.

British experience in Africa seems to differ from American experience in the Philippines, which simply means that the conditions in the two countries differ materially. Certainly the recent British experience in Africa does not in itself justify final unfavorable conclusions in the premises.

All tactical action consists in employing, by original and extemporized combinations, the various prescribed elementary movements in which the troops have been previously trained. Accordingly, collective controlled fire by volley being one of the prepared means placed at the disposal of a general, it may well be left in his hands for adaptation to necessities as they arise directly from tactical environment, and the incidents of the battle itself.

In the light of American experience, the volley should not only be retained as a useful form of fire action, but it should be developed by largely increased target practice therein, to include all ranges up to two thousand yards.

Denver, March 17, 1902.

Colonel Charles A. Coolidge, 7th U. S. Infantry.

As per request of your Publication Committee in writing my views upon the subjects of the article "Memorandum—Knell of the Volley,"

I would say that I agree with all Captain Parker has written in his article. It may be that the British in South Africa have arrived at different conclusions from a different standpoint, but I believe that the American army from their campaigns in Cuba, in the Philippines, and China, have always found the "volley," when properly administered, of great utility and efficiency, and as General Jacob Smith, when colonel of the 12th Infantry, used to denominate it "combing the bamboo" with his battalion volleys, it certainly instilled confidence into his men and demoralization to his enemies. I believe that it is almost the only kind of firing that ought to be permitted, except to sharpshooters, and then only when the distance from the enemy is so short that they can easily distinguish the individuals.

Volley firing requires an officer to have active command of his men, and the men know that he is with them and exercising supervision. This alone instills the confidence of the men in the officer and the officer keeps control of the men better, not only of their fire but of their movements. Good volley firing will demoralize an enemy greater than any other sort of fire, the percentage of hits being equal.

My personal experience is largely in favor of the "volley," and that is used too seldom rather than too much.

Vancouver Barracks, March 11, 1902.

Major R. L. Bullard, Commissary U. S. A. (Late Col. 39th Inf., U. S. V.)

The theory and reasons commonly stated in favor of the use of the volley cannot be denied. The practicability, the possibility of the volley after action has really been joined with any worthy opponent is another question. The dangers and drawbacks of individual fire are undeniable. The necessity for its use, the impossibility of using anything else after real action is joined, is equally undeniable, however undesirable, has long been so; and this necessity has been falling earlier and earlier in the fight as fire arms have increased in range and effectiveness. The Drill Regulations and the Firing Regulations practically acknowledge this while struggling ineffectually against it, as many soldiers have struggled for a hundred years.

Whether, therefore, it shall be volley or individual fire is a question not of what is most effective or preferable if we could do it, but of what only we can do, what we must do. Excluding surprises, infantry volley is in general possible only at long ranges, and *there it should be replaced by shrapnel*, and infantry reserve its strength and fire for closer quarters. The dissolving effect of fire at any but the longest ranges and first stage, in fact, before the real fighting has begun, enforces thin lines; thin lines mean extension; extension prevents volley. Again, before troops suffer, they can fire volley; when they suffer, that is when the real action has once begun, they cannot. This, I take it, is the irresistible logic of experience and fact which drove Napoleon and Roberts and is inexorably driving others with grief and groans to acknowledge the volley as

practically impossible and of no value, and individual fire alone effective as alone possible.

As its disadvantages are so manifest, individual fire is a damnably unpalatable, disagreeable pill which we have all been trying to avoid swallowing. The writer of "Knell of the Volley," Honig, in "Inquiries into the Tactics of the Future," and others, are trying to persuade us to quit making faces and swallow it, to acknowledge the inevitable and, recognizing its consequences, prepare to meet them. This is the only wise and manly course, and the note of gratification in "Knell of the Volley" is accounted for by the writer's belief that the high dicta of Napoleon and Roberts ought to convince us. That "in this matter we have nothing to learn from the English," I cannot agree. From their experience with the Boers we ought at least to learn the unavoidable necessity of individual fire, its power and its deadliness.

Individual fire is coming; we have not been able to avoid it in the past by training; we cannot avoid it now by argument or dwelling on the advantages of the volley; it has been coming all the time in spite of us, earlier and earlier in the action until at the present day it has spread over and monopolizes practically the whole field of the real fight. It is rendered necessary by the enemy's fire. It is necessary, but its evils may be lessened by thought of it as unavoidable, by training ourselves not to regard it as confusion in our own to be surely followed (as it is not) by overthrow, by adopting the best means to control and direct it, as by the higher moral and suitable tactical training.

The larger use of individual fire as a necessity ought not to disturb us:

1. It is the tradition of American fighting; it is admirably adapted to American individuality.

2. It does not mean wild, uncontrolled fire; it is capable of both direction and control and *it then becomes the most deadly of all.*

The corresponding loss of the volley ought not to disturb us: At the longer ranges where alone it is ordinarily possible, it ought to be replaced by shrapnel. Its real effect is far short of the imaginary. It is always ill-aimed, always an attempt to "pot." It always sounds more dreadful than it is. It is almost always overestimated. It is not successful against trained individual fire.

"Citing the war in South Africa as an illustration of his ideas, General Dragomiroff believes that the Boers shoot wonderfully because they do not shoot by order, but individually by their own initiative, that is, they shoot at a determined object. That is the cause of the great loss of the British in officers. 'I have always,' writes General Dragomiroff, 'advised and still advise this method as a proper system of fire discipline, and never did advise a system which is nothing but an idiotic noise, and whether it be grape from cannon or a hail of bullets from magazine rifle makes no difference.'"—*Army & Navy Journal.*

These views expressed by me before a post lyceum just before the

Spanish-American War, were received with respect by those officers who were experienced in fire and men in battle.

Near Lipa, Luzon, I saw two or three good volleys fired by fifty insurgents from 1000 or 1200 yards range into the flank of the 38th and 39th Infantry regiments in column of fours. Not a man was hit. An insurgent individual firer on the other flank at about the same range fired fifteen or twenty shots at the same target. He killed two men, and forced the deployment of a company to find and silence him. Of nature like to this was practically all my limited experience in the Philippines, although I myself sought earnestly, though often ineffectually, to use the volley for the sake of control.

"Are Disappearing Guns Essential to the Efficient Defense of Our Seaports?"

Captain John R. Williams, Artillery Corps, U. S. A.

The conclusion of the Gold Medal Essay (JOURNAL for March, 1902) is as follows:

"The installation of guns on disappearing carriages in the past has been based upon sound principles, and the best defense of our sea-coast requires that it shall be continued."

Part of Captain Hamilton's summary (same number) reads:

"A gun * * * that is at all times invisible, * * * is the best kind of a defense possible to have."

Both papers take the affirmative of the proposition, and both unite in declaring that the disappearing principle furnishes the best defense, but neither paper absolutely undertakes to prove that the disappearing principle is essential.

It is a good thing not only for coast artillery, but also for infantry and field artillery to "lay low" while the enemy is pounding away, to "bob up serenely" at the opportune moment, to fire, and then to "lay low" again, but such a system has not been found absolutely essential to victory in the past.

Though the disappearing principle has not been proved to be absolutely essential, we may stick to a good thing unless there is something better. No one, so far, has undertaken to show that there is anything better. Nor has either essayist dwelt upon one of the weightest reasons for the retention of the disappearing mount.

Concealment of the gun in action has, indeed, been thoroughly discussed, but concealment of the gun in time of peace is hardly less important. Of course, as long as we advertise to the world, in our General Orders, the location and armament of our sea-coast batteries, this last kind of concealment is difficult. The writer has in mind more than one harbor where a powerful battery or group of batteries betrays not the slightest sign to a curious eye on a vessel's deck. Even where the existence of the battery is suspected, the character of the armament and the number of guns are entirely hidden from the marine observer.

Means heretofore little used may be employed, too, to increase the degree of invisibility of the battery.

Concealment from the land side is equally desirable. The prying spectator should not be able to find in rear any station from which the gun positions are distinctly visible. That our idea of "concealment" is the same as that of the ostrich is not the fault of the Buffington-Crozier carriage. At Port Arthur the Japanese would have succeeded had every Chinese gun possessed a disappearing mount.

Why should not the disappearing gun really disappear?

Major William E. Birkhimer, Artillery Corps, U. S. A.

As this proposition is put, the burden of proof is laid with a heavy hand upon the disappearing carriage. In fact, it is incapable of discussion with apparent hope of arriving at a satisfactory conclusion, for, while it may be demonstrated that the disappearing carriage is superior to any other for mounting the heavy guns of our fortifications in many cases, to assert that said class of carriages is essential, which must mean in such connection absolutely necessary, is an altogether different proposition. The essayists seem to have appreciated this fact, for they restricted their proof to establishing that under certain conditions the disappearing carriage is advantageous. At best the subject is one extremely limited in scope and technical in character, though most important.

The claim that the disappearing carriage is much more complicated than its competitor fades away under the search-light of critical examination.

That laying cannot be done equally accurately with the disappearing as with the non-disappearing carriage is an assertion that it is believed experience has exploded; in fact, the claim of many intelligent and practical artillerists is now the other way; a belief based on practical demonstration.

The large development of rapid-fire from ship-board has recently rendered it more important than ever to protect the personnel of the land defense. As this protection is the principal reason for the invention of the disappearing carriage this increased naval rapid-fire has enhanced, at equal pace, the importance of this as compared with other carriages.

It is not apparent how the suggestion that the protection of the personnel serving the disappearing gun behind the parapet will operate prejudicially, by making the men timid, can be regarded otherwise than merely speculative. The chances are that this will be the last source of embarrassment. In a fight worthy the name between ships and the shore there will be danger as well as glory enough for all. And, far from the sense of security derived from this protection, contrasted with the open barbette, operating to make military eunuchs of the defenders, it should strengthen their courage.

Actual experience has demonstrated that the disappearing system will deliver, under like conditions, a considerably heavier fire from our large high-power guns than the other. This is an advantage of first importance.

The angle of fall of projectiles from ships, within reasonable fighting ranges, seems to create a zone of special usefulness for the disappearing carriage, commencing at the water's edge and extending up to sites of 100 feet elevation at least; and within which zone, having regard to protection of personnel of the land defense, open barbette carriages should not be used.

If it be true that other nations do not attach the importance we do to the disappearing principle, conclusions adverse to the latter should not from this circumstance be too hastily drawn. This principle is the offspring of our very extensive national system of coast defense. It is but natural, if true, that more attention has been paid to it in this country than in any other under the actually existing circumstances; because, more than any other, we have made a specialty of coast defense by heavy guns on land.

It is to be regretted that one of the essayists should have wandered from the discussion of the subject of disappearing carriages to indulge in gloomy forebodings regarding the results that may follow the transfer by law of the torpedo service from the engineers to the artillery. It is to be hoped that he will not permit disturbing spectres to be thus conjured up. When the artillery is tried in this new field it confidently is anticipated that they will be at least equally as efficient as, after having the torpedo system for thirty years, the engineers were found to be at the outbreak of the Spanish War.

Major Alexander D. Schenck, Artillery Corps, U. S. A.

That "protection" from an enemy's fire for artillerymen is more necessary than for any other soldier is probably not a fact. The very best protection afforded in any kind of a scrap is to punish your opponent sufficiently, which means to a much greater extent than he punishes you, otherwise you are very likely to get knocked out. The best protection for the artilleryman as for any soldier, lies in his efficiency and the accuracy, kind and volume of his own fire, and is based primarily on the number and kind of his guns, for the purchase of which a given amount of money is forthcoming. The more the carriages, etc., cost the less will be at hand for the guns. The cost of the different carriages as set forth in the discussion is far from being the ultimate cost—in San Francisco, Cal., for instance, transportation is a heavy addition, and when the excessive weight of the several parts of the disappearing carriage together with unwieldy forms have been duly considered, these items alone tell very heavily against it. The actual difference in the final cost in money, labor and trouble, for each emplacement for a heavy gun, would no doubt add several suitable R. F. guns, where fire would afford all the

"protection" necessary for the artillerymen, by keeping down the fire of the enemy from similar guns.

No enemy three thousand or more miles from his base is going to neglect his proper objective, our navy, for the purpose of seriously attacking one of harbors, adequately armed, mined, and equipped, even though the parapets were of paper simulating the real thing.

The one absolutely essential element which is so greatly lacking in our projects for defense is R. F. guns in anything like adequate numbers. And most if not all of these could have been provided if the first costly and unwieldy disappearing carriage had been consigned to the scrap heap where it rightly belonged.

The principles involved in its use have been carried so far beyond reason as to involve the absurd, and into the realms of the impractical. This is apparently far better understood in the military nations than by ourselves, hence, practically no disappearing carriages for heavy guns in other countries. It is possible that we may "know it all," but not probable.

Give us an adequate armament and system of properly defended mines, and there will be very little danger of an attack by an enemy's fleet, and if its commander be unwise enough to attack, we will find our proper and adequate "protection" for the artilleryman in the fire of our guns.

"Army Regulations."

Captain Albert Todd, Artillery Corps, U. S. A.

I have read with much interest and satisfaction the article on Army Regulations by Captain John Bigelow, 10th Cavalry, in the last JOURNAL. His suggestion that there should be a new edition of the Regulations every year is something I have been advocating for a great many years. There is no publication which should be more closely up-to-date than the Regulations, and the small additional cost of frequent publication should not be considered for a moment. I have heard some officers say, "Why can't the War Department let the Regulations alone for a while and not confuse us with so many amendments?" Alas! all things human are transitory. Regulations must change to meet new conditions, and it is simply impossible to preserve even for twelve months the text intact. But we who have to use them are justly entitled to be enabled to know the rules by which we are governed without having to consult a file of orders, may be six years back.

An additional suggestion that I would make is, to print the amendments, which now come out in general orders, also on slips the same width as the page of the regulations and in the same size of type. Ordinarily these slips would almost exactly fit over the regulation to be amended and could be readily pasted thereon. This is a habit I have followed for many years, but I have had to skirmish for the copies of orders to do it with, and moreover it is not always easy to make the slip

cut from the order fit in well. To every officer there should be sent a copy of each slip and he could readily keep his Regulations properly posted. I think this a better plan than to insert the amendment on a stub. Of course, there are some officers who would fling the slips aside, perhaps without reading, but against carelessness and indifference, the gods themselves fight in vain. Our present Chief Executive is on record as saying that the paper work of the army should be lessened. Amen! so say we all of us! And a live set of regulations, rather than one containing 25 per cent. of dead matter, would help shorten correspondence marvellously.

To digress a little from the immediate subject, I would like to invite attention to the iconoclastic, perhaps, but nevertheless wholly refreshing proposal of a certain artillery officer (whose name I withhold as I have not his authority to mention it) that in order to diminish an officer's paper work all periodical returns for property and money be abolished. He advocates the system that all officers accountable for anything should submit to a central office all original vouchers and that this central office should keep the officer's accounts. The original voucher is after all the only essential thing. If it is faulty no abstract or return can make it good. This idea may strike the bureaucrats with a cold chill, but it is certainly worthy of attention. For one thing it would do away with the memorandum receipt system. By it whenever any property or money left an officer's possession in any way, and he then obtained a receipt for it or the order of proper authority for disposing of it, his responsibility and accountability would both cease. Invoices and receipts, or orders for issue, or expenditure lists, or what not to cover the disposition, would be made as now, but that would end the papers so far as the officer is concerned. At the central office where one copy of these papers would be sent the proper officers would be credited or debited. Of course, practically all officers in the army would have accounts at the central office and there would be lots of work there, but, oh! how it would relieve the officers themselves and chase from their vision the ever-present spectre of the monthly and quarterly returns.

What think ye of the scheme, ye busy men, quartermasters, commissaries, company commanders, all trying your best to do the real work of your profession, but whose time is now wasted many weary days in each year in preparing the voluminous abstracts and returns which after all prove nothing unless the vouchers back of them are adequate.

Presidio, Cal., March 11, 1902.

Reviews.

"The Mastery of the Pacific." *

A VOLUME of timely interest to Americans, and of especial value to Army and Navy officers who have served or are to serve in the Philippine Islands, is A. R. Colquhoun's recently published book with the above title In his preface he says, "that while commercial interests have been considered, the main object has been to present a vivid impression of the various countries—their peoples, scenery, social and political life, and the parts they are destined to play in the great drama of the mastery of the Pacific."

While all will probably not agree with his conclusions, it will be admitted that the subjects have been impartially considered and judiciously discussed.

In the introductory chapter he gives a brief summary of the history of the discoveries in the Pacific, and the parts the various interested nations have played to date. This is followed by four chapters devoted to the influence of the United States in the Pacific—five chapters to England's influence—two to Dutch—and two to Japanese influence, while one chapter only is devoted to Germany, France, Russia and China.

In these the causes of international rivalries are revealed, and the policy and methods of colonial administration of each interested country discussed at length.

He contrasts the German and French methods as follows:

"The Germans fail in their colonies because they cannot recognize the essential fact that the official is there to serve the trader. They 'dragoon' the traders, treat them like raw recruits, and enforce an illiberal commercial policy, which interferes with the progress of the place. The administration generally has the flavour of the iron-bound military system or the pedantic bureaucracy of the motherland, neither suited to the exigencies of the case. The French, on the other hand, fail because, as has been said, they overgovern by the horde of inferior officials, try to keep the trade in French hands, thus adopting a shortsighted policy, and instead of being practical and dealing with what lies immediately to their hands are always looking abroad and following up some visionary idea. Of the two, however, Germany is the Power that will inevitably play an important part in the future history of the Pacific, because, whatever mistakes she may make in her colonial system, she is driven by circumstances to a policy of expansion and to the further extension of her trade and strengthening of her sea power.

The great advantage of position the Russians have over their European rivals in that they are now and have been throughout in a temperate climate—"the white man's country"—he recognizes and frankly admits. He claims that "the Muscovite is on trial in the lands bordering the Pacific, and if he should

* *The Mastery of the Pacific.* By A. R. Colquhoun. New York, 1898. The Macmillan Co.

fail it will be because all initiative comes from the top and not from the bottom, everything being done by the state and nothing by the individual."

Considerable complacency is noticeable in his discussion of British success in dealing with Asiatics, and it must be confessed that the results they have obtained justify it. They recognize clearly the necessity of sending big broad minded men to handle the problems and then realize the fact that being on the ground they know best what to do. They have learned that the men on the spot need loyal support from the Government, not cheap advice or criticism from sentimentalists who have not sense enough to realize that a government that is suitable for white men in temperate climates is not suited to Malays in a tropical climate,—a lesson we have yet to learn.

British success in dealing with the Malay he attributes to the fact that they "Interfere as little as possible with the manners, customs and prejudices of the various nationalities concerned and not at all with religious matters, especially the Mohammedan faith. Encourage all immigration, Chinese, Indian, or other, and the introduction of capital, European and Chinese. Open the country, by roads and railways, give security and prompt justice, abolish all import duties (except on spirits and opium) and all restraints on trade and industries."

The good and bad points of Holland's system of administration in her Pacific possessions are clearly stated. To the fact that the minor Dutch officials literally live with the people, thus acquiring a minute personal knowledge of the circumstances of each family, he attributes their success; this acting as a correcting influence to an over centralized system of administration. Thus they wisely recognize the influence of the personality of the white man over the Malay mind, an influence which was so cleverly utilized by the Spaniards in the Philippines in the person of the Friar. The difficulties the Dutch are encountering in Sumatra in the "Achin war"—which is consuming all the revenue of the colony—the half caste problem, and the causes which lead him to believe that Germany will eventually take over Holland's possessions in the far East, are well presented.

In the discussion of Japan the English-Japanese Alliance, which has been made public since the book was published, is foreshadowed.

The trouble Japan has had and is having in Formosa is given somewhat in detail, and it is in a way consoling to learn that they have not had any greater success in pacifying the island than we have had in the Philippines. It is such a common thing to hear Americans say– "Turn the Islands over to such and such a nation; it would soon solve the problem." Colquhoun takes the view that we have done about as well as any of them could do under the circumstances. What he has to say of our past work in the Philippine Islands and their future will be eagerly read by army officers especially. He gives his own views formed from personal observation, and on the whole they are extremely fair, manifesting as they do a sympathetic insight into, and a grasp upon, the problems that confronted our army there. He is of the opinion "that under the peculiar circumstances, despite a somewhat general opinion among Britons that the Americans 'made rather a hash of things'—that the troops, both officers and rank and file did wonderfully well."

His experience with similar people and his observation while in the Islands leads him to make the following criticism.

"The average United States officer is too much inclined to despise cere-

mony, to accept things as they are, to put up with indifferent quarters and inferior service. That is not the way to impress the Oriental race, who are perfectly aware that Western standards of comfort and decency are different to their own. The same criticism applies to the accommodation provided for privates. The writer is not an advocate for pampering troops, nor for mobile columns which carry pianos and canteen kitchens, but in many of the posts he visited the United States troops had been quartered for many months, fighting was practically over, and yet the men were miserably housed. They ate their meals in wretched huts or canvas shacks, slept apparently anyhow or anywhere, and owing to there being no regimental canteens spent their spare time in the small native drink shops. No amusements appeared to be organized for them, and the sub-lieutenants who in British India spend hours "sweating," as they express it, to get up cricket, football, concerts, theatricals and other distractions for Tommy, were themselves reduced to continual card-playing. The writer uses the past tense, since he is speaking of the summer of 1901; but the criticism, meant in no carping spirit, is one that the United States merit generally, and not only in these instances. They have splendid fighting material, but have hitherto been rather inclined to waste it, and if the army is to be made a popular profession and is to attract the best men, attention must be paid to that side of the service which keeps them in good health and spirits. The United States have decided that they now need a standing army of 100,000 men, but they hardly realize for how long a period it may be necessary to garrison the Philippines with a large force, and nothing is so detrimental to good work as the feeling that it is only a temporary expedient. It would have been far better, too, for the Filipinos to realize from the first that the Americans had come to stay, and nothing would have brought this home to them better than such measures as the provision of decent quarters for officers and men."

That we are inclined to despise ceremony, too much to impress Filipinos, is undoubtedly true. They do not appreciate our democratic ways and are inclined to despise us because of them.

As Spanish dominion there rested almost wholly on the influence of the Friars, so our dominion, for one generation at least, must rest on the profound respect and wholesome fear the Filipinos have for our soldiers as fighting men. The worst blunder that could be committed now, or at any time, would be any course of action on the part of the civil or milltary authorities that would cause the Filipinos to lose this wholesome respect. The problem to be solved by the officers there will be to repress the weaknesses, and develop and make manifest to the dullest Filipino understanding the capabilities of our soldiers; no easy task considering the temptations that surround them and the absence of influences that tend to temperate living.

Anyone who has come in intimate contact with the Malay will recognize the justness of the author's claim that "No Malay nation has ever emerged from the hordes of that race which have spread over the islands of the Pacific. Wherever they are found they have certain marked characteristics, and of these the most remarkable is their lack of that spirit which goes to form a homogeneous people, to weld them together. The Malay is always a provincial; more, he rarely rises outside the interests of his own town or village. He is never honest, as we count that virtue, never truthful, and never industrious or persevering. This is his dark side, but it is with that we are concerned. The two points which are most inimical to progress are, as already indicated, the lack of unity,

and the lack of persistence. The Malay is the laziest of Orientals. and the Filipino is not the least lazy of Malays. The Malay, in short, is a creature of limitations."

The army came into intimate contact with the dark side of the Filipino character. The wholesale assassinations instituted by Filipino leaders and apparently accepted by the Filipino people as a legitimate means of enforcing obedience to insurgent authority could not fail to produce a decidedly adverse opinion as to the capacity of the race for a high standard of civilization.

He makes it plain that nothing in the experience the English have had in the Straits Settlements justifies the optimism of those who hold that great changes in the character of the people will result from our efforts to educate and fit them for self government.

Our credulity in believing that every vicious trait in the Malay character is due to Spanish misgovernment, does little credit to our intelligence, and unless we frankly recognize the influence of race and climate our hopes as to the result of our efforts, founded as they now are, partly on egotism and partly on ignorance, are bound not to be realized.

He depreciates the haste shown in the transition from military to civil government as a detail of our policy and volunteers this advice.

"What is now wanted is not further statements as to the actual number of pagans in certain districts, or the percentage of immorality among the Friars, but experience and judgment in dealing with matters as they stand at present. All the information which can be had by cross-examining untruthful witnesses has been already collected, and the bones of the discussions are picked bare. Let America make up her mind broadly as to her relations to the Archipelago, and then let her put her faith in the men who have already devoted so much of their time to the problem. To send another commission would be merely to increase the number of smatterers. The best authority on the Philippines at present can be little more, but he knows something, and he is improving every day he spends in the islands. In Judge Taft America has a man thoroughly capable of facing the situation if supported from home. He cannot perform miracles, and he is bound to make mistakes but he is open to conviction, and that is an important thing. If given anything like a free hand and not bothered and harassed by congressmen, or reports from politicians who have taken a run out to Manila and found mares' nests, he will do very well. The ideal treatment, one which would have saved trouble, expense and failure, would have been a temporary military government, gradually merging into purely civil administration. This is apparently judged out of the question, out of the sentimental objections of the electorate in the States, which is so anxious not to hurt the feelings of the 'little brown brother.' This being the case, and a system having been inaugurated of quasi-independence, the advice of an on-looker who has seen a good deal of government in Oriental countries is to interfere as little as possible with the customs, prejudices and religion of the Filipinos, and to *keep a tight hold.*"

The good sense contained in the above should appeal to the intelligence of every official, military or civil, engaged in carrying out the policy of the Government in the Islands. The "ideal treatment" was not considered feasible. It devolves on all Americans in the Islands to see that the policy which the Government considers feasible does not fail, as the difficulties which have to be overcome are furnishing a test of our national character that is being closely

observed by powerful jealous nations who are trying to determine how far our emotional enthusiasm can be relied upon to accomplish the disagreeable task it has led us to undertake.

Nothing illustrates better the dominant tone of the book than his conclusion that

"The United States, in the opinion of the writer, will be the dominant factor in the Mastery of the Pacific. She has all the advantages, qualifications, and some of the ambitions necessary for the *rôle*, and her unrivalled resources and fast increasing population provide the material for future greatness. She is, however, embarking on an entirely new phase in her career, and is taking risks and responsibilities which she has hitherto been spared, and which, if they are to be carried to a successful conclusion, demand certain sacrifices and a remodelling of many of her most hide-bound conventions. A great deal of the machinery necessary for dealing with the complicated web of foreign affairs into which the United States has been drawn has yet to be created and organized, and large demands will be made on the patriotism and public spirit of the people.

"The new century dawns on a world in which the aspirations of the idealists are as little realized as ever. The two great nations who speak the English tongue are both at war, engaged on difficult and dangerous enterprises. And yet the writer urges them to further conflict, sounds the tocsin in their ears and bids them to prepare for a fresh struggle. There can be no rest, no pause in the march of a great empire; it must advance or decay—history has made that plain.

"The struggle for which the nations are preparing may be a step in the scale of the world's progress in that it need not involve the shedding of blood. Forethought, preparation, and sustained effort will be the only effective weapons in the coming conflict, and these alone will decide the Mastery of the Pacific." N.

The Sheridan Memoirs.

The republication of the Memoirs of General P. H. Sheridan* comes at an opportune time, just after the reorganization and enlargement of the Regular army, resulting in an increased interest in all things military upon the part of our people. Of course every old officer of the Regular army, and many or most of our Militia officers of experience are more or less familiar with Sheridan's exploits in the Civil War; but to the mass of the younger officers these memoirs will be new, interesting and instructive.

In the original edition General Sheridan brought his memoirs down to the year 1870, and ended with a narrative of his experiences in the Franco-Prussian War. He was prevented from telling the story of the last 17 years of his life by his illness and death. His brother, General M. V. Sheridan, U. S. A., whose intimate association with the General began late in 1861 and continued for 27 years, messing with him during the War, and sharing the same tent, and by his side in more than forty engagements, adds in the new edition a sketch embracing the more prominent episodes in his later life.

Chapter I. of the edition commences with the General's resumption of his old command, the Military Division of the Missouri, with Headquarters at

* *Personal Memoirs, Philip H. Sheridan, General U. S. A.*, with an account of his life, 1871–88, by Gen. M. V. Sheridan. New York, D. Appleton & Co., 1902.

Chicago, in 1871, and narrates the events of the campaign against the Piegans.

In the fall of 1871 occurred the great Chicago Fire. Chapter II. of the edition is devoted to a recital of Sheridan's connection with that event. "It furnished a new opportunity for the manifestation of his marked ability, which made him so prominent during the War, to grasp quickly the important phases of a situation. In the emergency he did not permit red tape to cause delay, nor had he stopped for a moment to consider the vexing question of States Rights. His only object was the relief of the distressed, and, as usual, he went directly to the point." President Grant fully approved of all his acts; and yet General Sheridan's very vigor and energy in the cause of humanity gave rise to a bitter attack on him by the Governor of Illinois. He sought to have Sheridan and others indicted for the shooting of an intoxicated man by a patrol. Sheridan never entertained the idea of proclaiming martial law.

Chapter IV. narrates the events of the Sioux campaign and the Custer massacre.

Chapter V. tells of another episode in Sheridan's career, brought about by the civil disorders in Louisiana in 1874 caused by the reconstruction of that State and its restoration to the Union. President Grant had desired him to resume the command from which he had been relieved by President Johnson in 1867, but the duty was distasteful to the General, and he had declined it. He had, as he thought, washed his hands of reconstruction and political squabbles by declining the command of the Department of Louisiana; but he was required by President Grant to go to New Orleans, "to ascertain the true condition of the race conflicts there, to suggest remedies, and in case of emergency to act as he deemed most judicious for the preservation of order." Sheridan was again required by the President to take personal charge of military affairs in Louisiana. His presence there this, the third time, grew out of the national election between Hayes and Tilden.

The writer of these notes, who was then on his staff, accompanied the General on his journey from Chicago to New Orleans, and was a witness to his great reluctance to interfere in politics, and the cooling effect his mere presence had on the excited populace. He was also a witness to the cooling effect his demeanor had on a wrecked carload of excited passengers, at the dead of night in the wilds of Mississippi. Sheridan was not wanted in New Orleans by certain elements, and they, it is supposed, took a rail from the track that our train might not reach there. Our sleeping car left the track, turned over on its side, and the writer landed on the writer of the additional chapters. We eventually extricated ourselves from the wreckage, and were naturally somewhat perturbed. Not seeing the General we feared he was hurt and unable to make himself heard or to get out of the car. We soon discovered our error, for he had turned over on the soft side of his berth, and was calmly awaiting events. He was making himself as comfortable as possible under the circumstances. In a couple of hours a relief train came to our aid, and our party changed cars; but the rest of the night journey to New Orleans was not spent in sleeping berths.

As is well known, violence was prevented, and the canvass for President conducted without intimidation. The mere presence of Sheridan was enough to preserve order.

In the autumn of 1883, on the retirement of General Sherman, Sheridan was assigned to the command of the army, and he removed to Washington. He

was exceedingly popular in Chicago, and while appreciating the distinction conferred he could not help regretting the close ties which bound him to his friends there. While commanding the army he instituted the concentration of troops in permanent barracks near the large cities, and the consequent abandonment of small frontier stations no longer necessary, and interested himself in the perfection of our modern system of Coast Defenses. Congress revived the grade of General of the Army for Sheridan while on his death-bed.

The IX and concluding chapter of the edition relates to the General's personality and his characteristic traits. "After leaving West Point he did much general reading, and was familiar with the campaigns of Napoleon, Frederic and other great captains, and the works of military critics; but he was not a student in the commonly accepted sense of the term. He applied what he learned through natural ability, that is to say, his quick perceptions, aptitude in geography, and unerring judgment made him intuitively a master of logistics, while self-reliance stood forth as one of his most prominent traits." "His physical courage was a noted characteristic. Though so slight in build he would, when thoroughly aroused, not hesitate at a personal encounter with a giant." "Sheridan took the offensive whenever possible." "Though quick tempered and impulsive, Sheridan was amiable in both his official and social relations." "He was not a deeply religious man, but he had a firm faith in the doctrines of his religion."

These additional chapters complete the life story of one of the greatest Generals of this or any other age or country. They are written with the same lucidity and conciseness which characterize the General's own writings. As the years go by Sheridan's exploits grow brighter, and his Memoirs will become a military classic.

J. W. REILLY,
Lt. Col. Ord.

U. S. General Hospital—Presidio.*

This interesting review of our great army hospital on the Pacific Coast is a tribute both to its organizers and the progressive spirit that permeates the army medical department. Few civil hospitals in this country, with the advantage of many years of existence and wealthy endowments, have reached a greater maturity or could show more successful results than this infant of three years.

It seems almost incredible, with his enormous volume of routine work, that the commanding officer could have found time for the perfection of the many details, his wonderfully successful operative work, and the careful study of the varied and complex diseases imported from our new Eastern possessions.

An examination of the vast amount of pathological work by Dr. Craig, indicates a most creditable, painstaking investigation of the many curious, comparatively unknown diseases which our soldiers have brought with them.

In this field, the most interesting details noted are the careful differentiation of the types of malarial fever, and the clear description of the plasmodium, peculiar to each type; the proved value of the agglutination test in typhoid, and the dysentery due to the bacillus of "shiga"; the interesting description of the amœba coli and its differentiation, as well as its strange resemblance to the segment of plasmodium and its corresponding reaction to quinine.

Other comparatively rare parasites described, are the cercomonas intesti-

* *The United States Army General Hospital, Presidio, Cal.* 1900-01. Reports by Lieut.-Col. A. C. Girard, D. S. G.

nalis, and the rhabdomena intestinalis, found in the fæces of those suffering from the so-called "Cochin China" diarrhœa.

Among the 372 operations performed by Col. Girard in the two years, were 33 for appendicitis, with no deaths, 71 Bassmi operations for the cure of hernia, with but one death, due to the effects of alcohol.

With departments for the treatment of diseases of the eye, ear, nose and throat, bacteriological and pathological work, radiography and electrical therapeutics, and a complete printing plant, it is difficult to imagine what is lacking to render this great hospital one of the most scientific of its kind.

It was a matter of general comment by foreign observers in the recent invasion of China by the allied forces, that the medical department of the American Army was the most completely equipped of all the various bodies of troops. The same observers would probably admit that few general military hospitals in the world would surpass, if equal, this which Col. Girard's energy, intelligence and devotion, have provided for our suffering soldiers. J.

Forthcoming Military Publications.

The Hudson-Kimberly Publishing Co., Kansas City, Mo., announces that the following works will appear during 1902:

THE TACTICS OF COAST DEFENSE. By Major John P. Wisser, Artillery Corps. A series of lectures delivered before the Naval War College (Newport, R. I.), and at Cornell University (Ithaca, N. Y.), supplemented by additional matter derived from the latest Naval and Military authorities, especially on combined Naval and Military Operations. The work comprises the tactical principles involved in the fortification of coasts, and the battle tactics of their defense against blockade, bombardment and attack by sea.

THE DUTY OF TROOPS DURING PUBLIC DISORDER, VIEWED FROM ITS LEGAL AND TACTICAL ASPECT. By an Officer of the U. S. Army. Embracing a consideration of the necessity and authority for the use of troops; orders for the movement of troops and instructions as to the nature of the duties required of them; the equipment of troops, their transportation and their subsistence en route; their conduct upon arrival at the vicinity of the place of duty; disposition of detachments and patrols for the protection of property or suppression of disorder; movement of troops through cities, selection and occupation of important points, means of communication and system of intelligence; quartering, subsistence, sanitary arrangements, and routine of duty.

A MANUAL OF FIRE TACTICS. By an Officer of the U. S. Army. Embracing modifications and developments due to modern high power, small calibre rifles, firing smokeless powder and using a magazine, with deductions from the results of the most recent wars bearing on fire discipline, individual skill with the rifle, skill of officers in collective firing, and practical instruction in field firing.

HAND-BOOK OF THE U. S. ARMY. By Two Officers of the U. S. Army. A short account of the U. S. Army, embracing conditions of service, Organization, Uniforms, Armament, Equipment, Food and Forage, Regulations, Marches, Camps, Drill Regulations, Distribution. A compilation of information on the above subjects from official sources in compact and readily available form and corrected up to date.

CARE OF SOLDIERS IN PEACE AND WAR. From a Medical Officer's Standpoint. By Major W. B. Bannister, Surgeon U. S. A. For the use of Officers of the line. Presenting a technical subject devoid of technical language and treated in a practical and interesting manner.

Our Exchanges.

Military.

Armée et Marine.—Feb. 23. The English-Japanese Treaty. The War in the Transvaal. March 9. The Papal Swiss Guard. Voluntary enlistments for Colonial Troops. The most powerful Man-of-War of each Nation. English Cruiser and Torpedo destroyer seeking cover in the Port of Brest. March 16. France at Yang-Tsé. The short enlistments. The new rifle. The new Artillery helmet. The Military and Naval Attachés in France. March 23. The usefulness of the Paris Horse in the Army. The Automobile and the Horse. The Photography and the Horse. April 6. History of the French Naval Academy.

Internationale Revue.—March. *Belgium:* General Pension Law. *China:* Japanese instructors for the Chinese Army. *Germany:* Recruiting.—The Army and Navy Conscription for 1900. *Great Britain:* Trials with Automobiles for Military purposes.—New regulations for Volunteers.

Journal, Royal United Service Institution.—February. The New French First Class Protected Cruiser *Chauteaurenault.*—The Situation in South Africa.—The Volunteer Force of India.—Military Observations on the War in South Africa.—Strietensk as a Base in the Campaign of 1900. March. The New French First Class Battleship *Jena.*—The Spontaneous Combustion of Coal on Board Ship.—Continental versus South African Tactics: A Comparison and Reply to some Critics.—Military Observations on the War in South Africa.—The Army and the Nation.

Journal of the United Service Institution of India.—January. The Conquest of Java.—The Practical Training of British and Native Troops in India with reference to the Lessons of the War in South Africa.—Entrenchments applied to Field Operations.—Scheme for expending the 200 rounds of Ball Ammunition allowed each soldier of British Infantry Annually.—Some Foreign Articles of Special Interest.

Journal of the United States Artillery. March-April. The Possibilities of the Camera Obscura as a Range and Position Finder.—Commentaries on Contemporaneous Art of Defence.—A Discussion of the Errors of Cylindro-Ogival Projectiles.—The Compilation of Range Finders.—Notes on Rapid-Fire Field Artillery.

La Belgique Militaire.—Feb. 16.—Munitions issued to our Troops.—Military Reorganization.—March 16. Firing Regulations.—The examination for entrance into the Military School.—The Failure of Voluntary Enlistments.—The Association of Retired Officers.—South Africa. March 23. The Question of

Military Authority.—In Camp at Beverlon.—For the National Defence.—The Civil Guard in Camp at Brussels.

Proceedings of the Royal Artillery Institution.—Nov. and Dec., 1901. Contrasts in the Conditions of Warfare at the beginning of the nineteenth and twentieth centuries and some deductions as to possible tactical formations for the future.—An old Table of Ordnance.—Recent Development of Field Artillery Material on the Continent. *Germany:* Thoughts on Coast Defence suggested by the Boer War. Boer position on the Tugela, 1899.—Colonel Sir Robert Barker, Kt. and Bt., F. R. S.—The Gunner's Whistle.—Captured Boer Guns.—Early Artillery.—Field Glasses for Artillery.—The Dickson Memoirs (continued). Jan. and Feb., 1902. Optical Aids for Military purposes.—Recent Development of Field Artillery Material ou the Continent. *France:* A scheme of position-finding without instruments on land fronts.

Revue d'Artillerie.—January. Artillery horses and Transportation.—Beneficial Gymnastic Exercises.—Debarcation of Dismounted Guns.—The Schneider-Canet Ordnance at the Universal Exposition. March. Automatic Revolvers.—The Artillery at the World's Fair of 1900.

Revue du Cercle Militaire —February 15. Competition for Admission to the Military Academy.—The Administrative Functions of the Minister of Marine. Feb. 22. Regulations providing for Artillery Field Manœuvres. March 8. An imaginary Anglo-French War.—The Evolution of Portable Firearms in the course of the 19th century. March 22. The Railroad of Bagdad.—The Reorganization of the Portuguese Army.

Revue Militaire des Armées Etrangères.—February. Studies of the South African War. 1899-1900.—The Imperial German Manœuvres of 1901.—The Military Schools of Austria-Hungary and their reorganization.—The Military Events in China, 1900-1901. March. The question of the Cannon without recoil in Germany.—Studies of the South African War, 1899-1900 (continued).—The re-enlisted man in the German Army.—The Imperial German Manœuvres of 1901 (continued).—The Military Events in China, 1900-1901 (concluded).

Revista del Circulo Militar (Argentina). January. The Military Year.—Handling troops in Mountainous Districts.—Infantry Regulations.—Cavalry on the Battle-field.—Bicycle Artillery.—Study of Semi-permanent Fortifications.—Organization of Bridge-Trains.—Military Telegraph.—Spring Manœuvres in the Argentine Army.—Army Schools.—From the Country of the Tobas.—The Camp at Makallé.

Revista di Artiglieria e Genio. February. The Reorganization of the Artillery and Engineers in 1806.—Cantono Apparatus for Electric Telegraph Stations.—International Law of Sieges.—Indirect Methods of Pointing for Artillery.

United Service. March. The Infantry Soldier.—The Bason's Song – Recollections of Reconstruction.—A Parallel to the South African War.—Personal recollections of what happened in Manila Bay after the Battle. April. The Naval Militia in the Spanish-American War.—A Tangled Web.—The Mortar in Coast Defence.—The Drama of Charlotte Corday.—Plodder's Promotion.—The Coming of the Submarine.—The New British Boats.—The Drummer Boy.—Personal recollections of what happened in Manila after the Battle.

United Service Gazette.—Feb. 8.—The Colonies and Imperial Defence.—Royal Humane Society's Awards.—Last Days of the Siege of Ladysmith.—The Army Medical School, Netley. Feb. 22d.—The Colonies and Imperial Defence.—The Transvaal War. March 1.—Medical Statistics regarding the Army of the Netherlands during 1900.—A Bulgarian opinion of the Russian Officers. March 8.—How the British captured the Dardanelles.—The Colonies and Imperial Defence (continued).—The Transvaal War (continued).—Losses at the Front.—The Army Corps scheme. March 15.—A Distinguished Royal Naval Engineer.—The Russian Route to the Capture of Constantinople. March 22.—A Reminiscence of the Indian Mutiny.—The Irresistible Court Martial. March 29. The Transvaal War.—Echoes from Abroad.—The Kussian Route to the Capture of Constantinople (continued.)—Training Soldiers in India.

United Service Magazine (London). March, Who are to Man the Forts?—Naval Education.—The cart before the horse.—The Defence of Gibraltar Docks.—The Elements of Fire Control in the Navy.—Extracts from speeches on Artillery.—Notes on the Evolution of Infantry Tactics.—Army Reform on a National Basis.—The Mekran Expedition.—Heavy Batteries of Royal Artillery (Past and Future).—The New Drill-Book. April. Garrisoning our Naval Bases.—Coast Defence and the Fleet. A reply.—Some Facts about Port Arthur.—Old attempts at Under-Water War.—Pages from the Diary of a Boer Officer.—Guerilla or Partisan Warfare.—Some Ideas upon the Training of an Officer.—The Anti-Patriotic Ulcer.—Upper Uoa, Ceylon, as a Station for British Troops.—The Future of the Coast Defence Artillery.—The Royal Reserve Regiments of 1900.

Naval.

U. S. Naval Institute, Proceedings of the. No. 101. A New Type of Battleship.—The Training Ship.—The Recruiting of the Navy Personnel.—Range or Direction Indicator.—Test of Conical and Cylindrical Breech Blocks.—Notes on the Method of making the Scale for a 24-inch Sounding Tube of the Tamer-Blish Pattern.

Marine Review; regular issues, to date.

Boletin del Centro Naval; regular issues, to date.

Revista Maritima Braziliera. History of the Naval Club.—The Technical Naval Institute.—Notes on the Stereoscope.—Causes of Napoleon's Failure on the Sea.—New Powders.—Military Pyrotechnics.—Maritime Resources of Brazil.

Miscellaneous.

Bulletin of the American Geographical Society; regular issues, to date.

Current Literature; regular issues, to date.

Journal of the Western Society of Engineers; regular issues, to date.

La Engeneira; Regular issues, to date.

La Revue Technique; regular issues, to date.

Political Science Quarterly; regular issues, to date.

Proceedings of the American Society of Civil Engineers; regular issues, to date.

Pennsylvania Magazine of History and Biography. April. Commodore

John Hazelwood, Commander of the Pennsylvania Navy in the Revolution.—Memoirs of Brigadier-General John Lacey of Pennsylvania.

Review of Reviews. March. South American War Issues.—Germany and America April. The Treaty between England and Japan.

The Scientific American ; regular issues, to date.

The Dial ; regular issues, to date.

The Popular Science Monthly ; regular issues to date.

The Seventh Regiment Gazette ; regular issues, to date.

The Medical Record ; regular issues, to date.

The Century Magazine ; regular issues, to date.

The Army and Navy Journal ; regular issues, to date.

The Army and Navy Register ; regular issues. to date.

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Membership dates from the first day of the calendar year in which the "application" is made, unless such application is made after October 1st, when the membership dates from the first day of the next calendar year.

Initiation fee and dues for first year $2.50; the same amount annually for five years subsequently. After that two dollars per year. This includes the Journal. Life membership $30.

NOTE.—Checks and Money Orders should be drawn to order of, and addressed to, "The Treasurer Military Service Institution," Governor's Island, New York Harbor. Yearly dues include Journal.

Please advise promptly of changes of address.

Gold Medal—1902.

First Prize—Gold Medal, $100 and Life Membership.

Second Prize—Silver Medal, Honorable Mention and $50.

I.—The following Resolution of Council is published for the information of all concerned:

Resolved, That a Prize of a Gold Medal, together with $100 and a Certificate of Life Membership, be offered annually by THE MILITARY SERVICE INSTITUTION OF THE UNITED STATES for the best essay on a military topic of current interest, the subject to be selected by the Executive Council, and a Silver Medal and $50 to the first honorably mentioned essay. The Prizes will be awarded under the following conditions:

1. Competition to be open to all persons eligible to membership.

2. Each competitor shall send three copies of his Essay in a sealed envelope to reach the Secretary *on or before January* 1, 1903. The Essay must be strictly anonymous, but the author shall adopt some *nom de plume* and sign the same to the Essay, followed by a figure corresponding with the number of pages of MS.; a sealed envelope bearing the *nom de plume* on the outside, and enclosing full name and address, should accompany the Essay. This envelope to be opened in the presence of the Council after the decision of the Board of Award has been received.

3. The prize shall be awarded upon the recommendation of a Board consisting of three suitable persons chosen by the Executive Council, who will be requested to designate *the Essay deemed worthy of the prize;* and also in their order of merit those deserving of honorable mention.

In determining the essay worthy of the prize, the Board will be requested to consider its professional excellence, usefulness and valuable originality, as of the first importance, and its literary merit as of the second importance. Should members of the Board determine that no essay is worthy of the prize, they may designate one or more essays simply as of honorable mention; in either case, they will be requested to designate one essay as first honorable mention. Should the Board deem proper, it may recommend neither prize nor honorable mention. Should it be so desired, the recommendation of individual members will be considered as confidential by the Council.

4. The successful Essay shall be published in the Journal of the Institution, and the Essays deemed worthy of honorable mention shall be read before the Institution, or published, at the discretion of the Council which reserves the right to publish any other Essay submitted for a prize, omitting marks of competition.

5. Essays must not exceed twenty thousand words, or fifty pages of the size and style of the JOURNAL (exclusive of tables), nor contain less than 10,000 words.

II.—The Subject selected by the Council at a meeting held November 8, 1901, for the Prize Essay of 1902, is

"THE ORGANIZATION AND FUNCTIONS OF A BUREAU OF MILITARY INTELLIGENCE."

III.—The gentlemen chosen by the Council to constitute the Board of Award for the year 1902 are:

MAJOR GENERAL E. S. OTIS, U. S. A.
BRIG. GENERAL A. E. BATES, U. S. A.
COL. H. C. HASBROUCK, ARTILLERY CORPS.

GOVERNOR'S ISLAND, N. Y.
Jan 1, 1902.

T. F. RODENBOUGH,
Secretary.

The Seaman Prize.

MAJOR LOUIS L. SEAMAN, M. D., LL. B. (late Surgeon, 1st U. S. Volunteer Engineers), has founded a prize in the MILITARY SERVICE INSTITUTION OF THE UNITED STATES, by contributing annually

One-hundred dollars in Gold

for the best Essay, subject to be named by himself, and to be approved by the Executive Council.

The subject proposed and adopted for 1902 is:

"THE TREATMENT AND PREVENTION OF TROPICAL DISEASES BASED UPON THE OBSERVATIONS OF AMERICAN ARMY MEDICAL OFFICERS."

The competition is open to all Officers or ex-Officers in good standing, of the Regular or Volunteer Service of the U. S. Army.

Three copies of the Papers on the subject must be submitted to the Secretary of the Institution, to reach his office not later than Nov. 1, 1902. Each Essay must be limited to 15,000 words, exclusive of statistics.

All other conditions will apply as those connected with the Annual Military Service Institution Gold Medal Prize.

The gentlemen chosen by the Council to constitute the Board of Award for the year 1902, are:—

COLONEL C. R. GREENLEAF, LIEUT.-COL. VALERY HAVARD, and MAJOR JOHN VAN R. HOFF; all of the Medical Department, U. S. A.

GOVERNOR'S ISLAND, N. Y.
Jan. 1, 1902.

T. F. RODENBOUGH,
Secretary.

Prizes for Short Papers.

Extract from the Minutes of a Stated Meeting of the Executive Council of the Military Service Institution of the United States, Major General Brooke, V. P., in the Chair, held at Governor's Island, N. Y. H., March 14, 1902.

* * *

Resolved: That the regulations governing the award of Annual Prizes be and they are amended as follows:

* * *

Hancock (Infantry) Prize.

The *Hancock Prize:* $50, and Certificate of Award; and $25, and Certificate of Award: to be given for the best and second best original essays or papers, the awards to be made under existing regulations for the Gold Medal, excepting that the papers shall contain not less than 2500 words nor more than 12000 words, and that but one copy of each paper shall be required from the author: said essays to be critical, descriptive, or suggestive. on subjects directly affecting the Infantry or foot service, which have been published in the JOURNAL of the Institution during the twelve months ending February 28 of each year and which have not been contributed in whole or in part to any other association, nor have appeared in print prior to their publication by the Institution, nor have been published in the JOURNAL in any previous year, and excluding essays for which another prize has been awarded. The certificate of award to be signed by the President and Secretary of the Institution and the award to be made upon the recommendation of a committee of three members of the Institution, not members of the Executive Council, two of whom shall be Infantry officers to be appointed annually by the President; the award to be made and announced not later than May 1 of each year.

Fry (General) Prize.

The Fry Prize: to be the same as the Hancock Prize and awarded upon the recommendation of a board of three members, not members of the Executive Council, under the same regulations for papers or essays appearing in the JOURNAL during the twelve months ending August 31 of each year, on subjects directly affecting the military service and not otherwise provided for, with the announcement not later than November 1.

Resolved, That in addition to the other annual prizes for short papers there shall be created two prizes, as follows:

Buford (Cavalry) Prize.

The Buford Prize: to be similar to the Hancock Prize, and to be awarded on the recommendation of a board of which two members shall be Cavalry officers, for papers published in the JOURNAL during the twelve months ending April 30 of each year, on subjects directly affecting the Cavalry or Mounted Service; with announcement not later than July 1.

Hunt (Artillery) Prize.

The Hunt Prize: to be similar to the Hancock Prize and to be awarded on the recommendation of a board of which two members shall be Artillery officers, for papers published in the JOURNAL during the twelve months ending June 30 of each year, on subjects directly affecting the Artillery Service, with announcement not later than September 1.

Gold Medallists and other Prize Winners.

(*G. M., Gold Medal*; *F. H. M., First Honorable Mention.*)

1880. *G. M.* **Gibbon, John**; Col. 7th U. S. Infantry, and Bvt. Brig.-Gen'l U. S. A.

F. H. M. **Wood, C. E. S.**; Lieut. 21st U. S. Infantry.

Subject.—"Our Indian Question."

1881. (No subject for competition.)

1882. *G. M.* **Lazelle, Henry M.**; Lieut.-Col. 23d U. S. Infantry (now Colonel retired).

F. H. M. **Greene, F. V.**; Capt. Corps of Engs., U. S. A.

Subject.—"The Important Improvements in the Art of War During the Past Twenty Years, and their Probable Effect on Future Military Operations."

1883. *G. M.* **Wagner, Arthur L.**; Lieut. 6th U. S. Infantry (now Lieut.-Col. Adjt. Genl's Dept. U. S. A.).

F. H. M. **Michaelis, O. E.**; Capt. Ordnance Dept. U. S. A.

Subject.—"The Military Necessities of the United States, and the Best Provisions for Meeting Them."

1884. *G. M.* **Price, Geo. F.**; Capt. 5th U. S. Cavalry.

F. H. M. **Dudley Edgar S.**; Lieut, 2d U. S. Artillery (now Major J. A. Genl's Dept.. U. S. A.).

Subject.—"The Necessity for Closer Relations Between the Army and the People, and the Best Method to Accomplish the Result."

1885. *G. M.* **Woodhull, A. A.**; Bvt.-Lieut. Col., and Surgeon, U. S. A. (now Col. U. S. A. retired.)

F. H. M. **Dodge, R I.**; Col. 11th U. S. Infantry.

Subject.—"The Enlisted Soldier."

1886. *G. M.* **Woodruff, Thos. M.**; Lieut. 5th U. S. Infantry.

F. H. M. **Schenck, A. D.**; Lieut. 2d U. S. Artillery (now Major Artillery Corps, U S. A.).

Subject.—"Our Northern Frontier."

1887. *G. M.* **Sharpe, Alfred C.**; Lieut. 22d U. S. Infantry (now Major Adjt. Genl's Dept., U. S. A.).

F. H. M. **Sanger, Wm. Cary**; Q. M. 2d Brig. Staff, N. G. S. N. Y. (now Assistant Secretary of War.)

Subject.—"Organization and Training of a National Reserve for Military Service."

1888. (No Prize awarded.)

Subject.—"The Danger to the Country from Lack of Preparation for War."

1889. *G. M.* **Read, G. W.**; Lieut. 5th U. S. Cavalry (now Capt. 9th U. S. Cavalry).

F. H. M. None.

Subject.—"A Practical Scheme for Training the Regular Army in Field Duties for War."

1890. (No subject for competition.)

1891. *G. M.* **Reed, H. A.**; Lieut. 2d U. S. Artillery (now Capt. Art'y Corps U. S. A.).

F. H. M. **Pettit, J. S.**; Capt. 1st U. S. Infantry (now Major 1st U. S. Infantry).

Subject.—"The Terrain in its Relations to Military Operations."

1892. *G. M.* **Stuart, S. E.**; Lieut. Ordnance Dept., U. S. A.

F. H. M. None.

Subject.—"The Army Organization best Adapted to a Republican Form of Government, which will Ensure an Effective Force."

1893. *G. M.* **Scriven, G. P.**; Captain Signal Corps, U. S. A. (now Major Signal Corps, U. S. A.)
F. H. M. **Hamilton, W. R.**; Lieut. 5th U. S. Artillery (now Capt. Art'y Corps, U. S. A.)
Subject.—"The Nicaragua Canal in Its Military Aspects."

1894. *G. M.* **Ellis, E. A**; Captain 8th U. S. Cavalry (now Major 13th U. S. Cavalry).
F. H. M. **Steele, M. F.**; Lieut. 8th U. S. Cavalry (now Capt. 6th U. S. Cavalry.)
Subject.—"Discipline; Its Importance to an Armed Force, and the Best Means of Promoting and Maintaining it in the United States Army."

1895. *G. M.* **Sharpe, H. G.**; Captain Subsistence Dept., U. S. A. (now Colonel Subsistence Dept., U. S. A.)
F. H. M. None.
Subject.—"The Art of Supplying Armies in the Field, as Exemplified During the Civil War."

1896. *G. M.* **Pettit, J. S.**; Captain 1st U. S. Infantry (now Major 1st U. S. Infantry.)
F. H. M. **Hill, R. G.**; Lieut. 20th U. S. Infantry.
Subject.—"The Proper Military Instruction for our Officers. The Method to be Employed, its Scope, and Full Development."

1897. *G. M.* **Foote, S. M.**; Lieut. 4th U. S. Artillery (now Capt. Art'y Corps, U. S. A.)
*F. H. M.** **Glassford, W. A.**; Capt. Signal Corps, U. S. A. (now Major Signal Corps, U. S. A.)
Subject.—"Based on the Present Conditions, and Past Experiences, How Should our Volunteer Armies be Raised, Organized, Trained, and Mobilized for Future Wars?"

1898. (No Essays received in competition.)
Subject.—"Our Water Boundaries, and our Interior Waterways; How to Utilize and Defend them; Their Influence in Case of Invasion."

1899. *G. M.* **Britton, Edward E.**; Supernumerary Colonel N. G. N. Y.
*F. H. M.** **Barry, Herbert**; Lieut. Squad. A. N. G. N. Y. (now Capt. Squadron A., N. G. S. N. Y.)
Subject.—"In What Way Can the National Guard be Modified, so as to Make it an Effective Reserve to the Regular Army in Both War and Peace."

1900. (No Gold Medal awarded.)
*F. H. M.** **Allen, H. T.**; Capt. 6th U. S. Cavalry and Major 43d U. S. Volunteers.
Subject.—"The Organization of a Staff Best Adapted for the United States Army."

1901. *G. M.* **Stuart, Edwin R.**; Lieut. Corps of Engineers, U. S. A.
Subject.—"Are Disappearing Guns Essential to the Defense of our Seaports?"
F. H. M. None.

Seaman Prize.

Seaman Prize has been awarded.

1900. **Munson, E. L.**; Captain Medical Department U. S. A.
Subject.—The Ideal Ration for an Army in the Tropics.

1901. **Rhodes, Charles D.**; Captain 6th U. S. Cavalry.
Subject.—"The Utilization of Native Troops in our Foreign Possessions."

Hancock Infantry Prize.

1902. (*1st*) **Stule, M. F.**; Captain 6th U. S. Cavalry.
Subject.—"Some Army Defects."
(*2d*) **Lewis, E. M.**; Captain 20th U. S. Infantry.
Subject.—"Discipline."

*and Honorarium, $50.

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